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MESSAGE

OF

THE GOVERNOR

TRANSMITTING THE

REPORT OF THE BOARD OF COMMISSIONERS

OF THE

ILLINOIS AND MICHIGAN CANAL,

TO THE

LEGISLATURE OF ILLINOIS,

DECEMBER 31, 1838.

VANDALIA:
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MESSAGE.

EXECUTIVE DEPARTMENT,
Vandalia, January 1, 1839.

SIR: In compliance with a resolution of the House of Representatives, calling on this department for the report of the Board of Commissioners of the Illinois and Michigan canal, I have the honor herewith to transmit to you their report made to me in conformity to law, which I received on this morning, and which I respectfully request you to lay before the body over which you have the honor to preside.

I am, sir, with high respect,
Your obedient servant,
THOMAS CARLIN.

To the Hon. the SPEAKER
of the House of Representatives.

REPORT

OF THE

BOARD OF CANAL COMMISSIONERS.

CANAL OFFICE,
Lockport, Dec. 13, 1838.

To his Excellency THOMAS CARLIN,
Governor of Illinois.

SIR: In obedience to the requisitions of law, the Board of Commissioners of the Illinois and Michigan canal have the honor of transmitting to your Excellency the following

ANNUAL REPORT.

The transactions of the first Board, from its commencement of operations to the close of the year 1836, were submitted to the Legislature in January, 1837; soon after which the law was materially amended, important examinations were ordered, additional works were authorized, and the superintendence of the canal was committed to the charge of the present commissioners.

At the called session, held in July of the same year, the new Board gave a full detail of their "acts and doings" to the first of June preceding. This report, therefore, as well to facilitate legislative action as to elucidate the subject clearly, will begin at that period and complete the chain of proceedings to the first of the current month.

That the information, herein communicated, might be as satisfactory as possible, the principal engineer was instructed to spare no pains in reporting the progress and condition of every class of construction—the improvements effected in plans and locations—the suitability of stone and other material for structures—the character of excavations as now devel-

oped—the difficulties that have been obviated, and those yet to be encountered—the probable sufficiency of contract prices—and all other minutia in anywise appertaining to his department. He has discharged this duty with his usual frankness and ability, as will be seen by a recurrence to his report, marked A, which has been carefully examined, and was found to harmonize so fully with the opinions and observations of the commissioners as to render it unnecessary, on their part, to say much more on that branch of the subject.

The documents, marked B, C, and D, are reports from the resident engineers, made by order of the Board. They are intentionally more diffuse than those of the chief engineer, and are believed to be correct representations of the affairs of the respective divisions.

In accordance with the fourteenth section of the canal law of 1836, the accounts of the Treasurer have been regularly collated with those of the Branch of the State Bank at Chicago, and their uniform agreement has been certified at the end of each quarter in the minutes of the Board. His ample report, marked E, exhibits the present state of the Treasury—the amount, time, and rate of loans—the interest paid and received by the canal fund—the receipts from the sales of town lots, and how many of these lots have been forfeited by the purchasers.

The Secretary of the Board, who, from the beginning, has acted as disbursing officer of the contingent fund, has discharged that arduous duty with accuracy and fidelity. His books, accounts and vouchers, like those of the Treasurer, have been examined and approved, from time to time, and are now in creditable order. An exposition of the business of his office, embraced in a report, marked F, will show—1st. The quarterly accounts of the Branch Bank at Chicago, since the last day of May, 1837. 2d. The amount of all moneys expended by order of the Board, and the heads under which the expenditures have been charged. 3d. The account of sales of lots at Lockport, Ottawa, and La Salle, with the valuation of each lot, and the sum for which it was sold. 4th. The work done, and the prices allowed for the various kinds of work. 5th. The contracts made, with whom made, and the security given. 6th. The number of engineers, surveyors. draftsmen, clerks, and agents, of every description, permanently employed, their names and the compensation paid to each. 7th. The amount expended in provisions and materials to aid the contractors—the quantity of these provisions and materials distributed, and the cost of what remains in store. 8th. The amounts advanced to contractors in money and in materials, over and above their monthly estimates, and also the sums ultimately due to the same contractors in consequence of the regular deduction of fifteen per centum from the value of their work.

Of the several items composing the Secretary's exposition, the six first enumerated contain such information only as the law specifically enjoins the commissioners to report. The two last have grown out of irregularities forced upon the Board by the peculiar condition of the country and of the times. The operations upon the canal, during the whole of the year 1836, and the major part of the year 1837, were chiefly confined to preparatory work, such as building houses of accommodation for the laborers, procuring implements, making defences, erecting machinery, &c.; all of which required but few men; and indeed very few had yet arrived in the

country. But in the fall of the latter year laborers became more plenty, and the principal work was prosecuted with great vigor. It was soon ascertained, however, that the country was bare of many of the essential materials required by the contractors; among which were iron and steel for manufacturing their tools and machinery, gun-powder for blasting rock, chains, and cordage for their pumps, cranes and railways, and staple provisions for the winter sustenance of their workmen. Derangement of business and heavy pecuniary sacrifices on the part of the contractors were the results of such a state of things; besides which many of the laborers were reluctantly compelled to abandon the line, and the contractors, deprived of facilities, were unable to employ others, who were constantly coming in from Canada and the Eastern States. The evil was generally acknowledged to be one of vital character. It dispirited the strongest and most enterprising contractors, and was abundantly calculated to suppress responsible propositions for the remainder of the work, unless at prices large enough to cover all the actual, and many alleged disadvantages. Nor was there any reasonable prospect of an early remedy except through the interference of the commissioners. The contractors were evidently too weak in capital to avail themselves of the proper time of the year for accumulating sufficient quantities of indispensable supplies; the Bank, if willing, was not in a condition to afford relief; and a reliance upon merchants in so new and remote a country was not only precarious, but calculated to invite monopoly and consequently extortion. It may be safely advanced that, on works of magnitude, be the contract prices ever so low, the employer will eventually have to pay whatever it cost the contractors to execute their work; for it is known that they are rarely if ever able to finish extensive jobs by which they are to lose. They cannot long support themselves without adequate compensation. As soon as they foresee a loss they are almost sure to abandon at all hazards; and work under such circumstances is apt to be relet on disadvantageous terms to the State. Every thing therefore that is done to save contractors from losses and delays, that can be averted, will, to the same extent, promote the interests of the public. Taking these facts and conclusions into view it was obvious to the commissioners that the contractors must be aided, for awhile, beyond the monthly regular payments from which fifteen per centum was to be deducted. Accordingly, at the commencement of the last season, the Board complied with the general request of the contractors to furnish them with such provisions and materials as could not be readily purchased in the country; each contractor binding himself in writing to secure the State against loss by insurance, interest, transportation, or any contingency, and to pay for the articles as fast as he consumed them, out of his monthly estimates, if required by the Board. A warehouse was built for the purpose, on State property, at Lockport, and so planned and positioned that while it increased the value of the surrounding property not yet brought into market, it will at any time command a profit on its cost. Table No. 6, annexed to the Secretary's report, shows the amount of capital now involved in the transaction to be $36,917 74, and table No. 7 exhibits the extent to which aid has been afforded, and the ample security on which it is based. Experience has proved the utility of the measure, both in supporting the old contractors and in obtaining new ones on reasonable terms. Full supplies are now maintained at

fair and uniform prices, encouraging the contractor to proceed with confidence, and enabling him to make better outfits and to do more work with the same capital and manual force.

On the 13th day of November, 1837, the sealed proposals for work, advertised to be let on that day, were opened, and contracts were entered into for the remaining sections on the summit and lower divisions, together with the Fox river feeder, dam and guard-lock. Another public letting was held on the 5th day of June last, which resulted in contracts for twenty-one miles of that portion of the middle division lying between Lockport and Dresden, including structures of every description. The structures of the lower division were let at the same time. It frequently happens in such cases, as it did in these, that several contractors to whom work was awarded failed to commence in proper time; and some, not being able to command capital, threw up their jobs; but the vacancies have been subsequently filled at prices as low as could be desired. The line is now under contract from the Chicago river to the termination at La Salle, with the exception of about twenty-two miles of shallow cutting between Dresden and Marseilles, and some other detached parts, amounting by estimate to $1,251,103 15, and a mile and a fraction of excavation in the Saganaskee swamp, which, from the peculiar character of the work, as described in the report of the chief engineer, must either be executed in part by agents of the State, or wholly deferred until it can be drained through a series of sections below it. To avert the delay incident to the latter course, the first has been adopted, with orders for the immediate preparation of appropriate machinery. Efforts will be made to have every thing ready for a commencement by the breaking up of winter. It was once thought that no subdivision of equal length would cost as much or present as many difficulties as the one which stretches through this famous swamp. The semi-fluid alluvion and vegetable matter, of which the swamp is mostly constituted, are not more forbidding in their aspect than they are treacherous in their texture. Hence for nearly two years it was impracticable at any season, by any mode, to penetrate it so thoroughly as to ascertain with certainty its true depth and character. The hard freeze of last winter and the low stage of the river and bordering morasses enabled the resident engineer, with a strong party, to traverse and sound every part of them. It was found that the Des Plaines could be safely turned into its ancient channel behind a low island about a mile in length, redeeming by the process some three or four hundred acres of canal land, and securing to the State an important town site which, by any other arrangement, would have fallen on individual property. Convinced of the practicability of turning and dyking the river, and that the flood waters of the Saganaskee valley could be diverted into the Calamic, there was no further hesitation in cancelling the contracts on the original circuitous route, and locating a direct line costing upwards of a hundred and twenty thousand dollars less, and possessing other obvious advantages independent of the town site, which at no remote period must be worth a large sum of money. For details, see reports of the principal and resident engineers.

In making contracts on the summit division, previous to December, 1836, distinct prices were allowed for "*solid rock*," and "*for rock which in the opinion of the chief engineer may be quarried.*" This distinction arose

in necessity. When the first letting was held in Chicago in June, 1836, the commissioners, prompted by policy and public opinion, were compelled to make an experimental letting of a portion of the heavy work without strict regard to its true value. Among the many proposals that were submitted at the time, there were but few from experienced contractors, or such men as could be trusted with difficult undertakings; and these, at that early period, with nothing to guide their judgments but a rapid and superficial examination of the country, were reluctant to act upon the assertions of the commissioners and engineers, that the rock to be excavated was wholly stratified. They admitted that the indications were in favor of that position, but urged that "solid rock" might probably be encountered towards the bottom of the deep cutting; and, if so, that much higher prices must be allowed than those at which they were willing to take the "*quarried rock.*" The issue was, that the accepted proposals and, of course, the contracts embraced both classes. But the commissioners continued so firm in their first impressions, that they disregarded extravagant bids for "*solid rock*," whenever the same proposal contained a reasonable price for "*rock which in the opinion of the chief engineer may be quarried;*" and especially as the umpire would be a State agent, and probably the same who had repeatedly advised the Board that the admission of the contingency in question would involve no serious danger.

Through the remainder of that year many sections were opened to various depths, yet no earnest demands for solid rock compensation were preferred until just before the meeting of the General Assembly. Those that were then made were promptly resisted, and the petitioners, threatening to appeal to the Legislature, were unsuccessfully encouraged by the commissioners to pursue that course. It will be remembered that during the session alluded to, a resolution was adopted by the House of Representatives ordering an investigation into the affairs of the canal. The committee, to whom the subject was referred, made, among others of a like tendency, the following comment on the estimates of the chief engineer. "It will be perceived that the item of rock excavation has been estimated as coming within the denomination of *quarried rock*, whereas all the information which your committee has been enabled to obtain upon that subject, tends to show conclusively that at least two-thirds of the item will fall under the class of *solid rock* excavation. If this be the fact, and that it is has been proved to the satisfaction of the committee, the whole amount, as estimated by the engineer, must be greatly enhanced. By reference to contracts already let as solid rock excavation, it will be discovered that the average price is nearly $2 55. Assuming this sum, then, as the price for solid rock excavation, and computing two-thirds of the whole amount of rock excavation at about $2 55, the price for solid rock excavation, and the remaining one-third at $1 55, the price per cubic yard for quarried rock excavation, and the sum total for rock excavation on this division is found to exceed the estimate of the engineer, $2,050,800; by which it appears that the item of rock excavation alone amounts to $6,814,331. But admitting the whole item to fall under the denomination of quarried rock, it is believed that contractors could not be procured to excavate the same at prices less than those allowed for solid rock, on account of the great elevation to which it would have to be raised, after

being quarried, to remove it from the works, A moment's reflection will show the truth of this view of the subject."

These opinions, it is believed, emanating as they did from a high source, stimulated some of the contractors to insist with pertinacity upon an immediate allowance for "solid rock." Others, who made no present claim, spoke freely of their intentions to contest the matter upon the completion of their work; and it was ascertained by the Board that some of the parties, encouraged by able counsel, were actually making preparations to fortify their position. In view of all these circumstances, and knowing at the same time the uncertainty of legal decisions, the commissioners were forced to believe that, however unjust the claims, there was imminent danger in permitting the contractors to finish their work, under the existing contracts, if it were possible to prevent it without violating the faith and dignity of the State. It was therefore resolved that while the contractor, in disregard of equity, insisted upon every advantage which he could obtain by law, the commissioners would be equally rigid in ruling him to the letter of his contract; and accordingly the chief engineer was instructed to issue his certificate of abandonment, in every case, on the first clear provocation. Some had already violated their contracts by selling them and giving irrevocable letters of attorney, setting forth a valuable consideration; others had failed to commence and prosecute their work in accordance with the reasonable requisitions of the superintending engineer; and it was extremely doubtful whether any of them could complete their jobs within the time specified in their respective articles of agreement. Thus situated, and being apprised of the determination of the Board to coerce justice if any longer denied, they were gradually induced to relinquish their disputed contracts and enter into new ones based upon the former prices for "quarried rock," with slight additions in such cases as experience had shown were originally taken at too low a rate. The final settlement of this vexed question is highly advantageous to both parties. The contractor is placed upon a footing which leaves no doubt of his ability to finish his work; and the State, besides avoiding hazardous and expensive litigation, can now estimate with certainty the ultimate cost of her great enterprize.

In the quarterly report of the Board, transmitted to the General Assembly in July, 1837, it was stated that a correspondence had been opened with Judge Wright, an eminently "skilful engineer," with a view to the surveys and examinations required by the third section of the amendatory canal law passed in the previous March. In the meantime, Mr. Burnett, who is now the resident engineer of the third division, was instructed to make a critical and thorough survey of the dividing ridge between the Fox and Des Plaines rivers, and "within the limits of the State." This duty he performed with great care, eliciting information from every accessible source, and indulging those persons who desired explorations of particular depressions previously supposed and asserted to be sufficiently low to afford a cheap feeder.

Judge Wright arrived at Chicago in the early part of October, and on the 20th of the same month, Mr. Burnett made a detailed report, with a topographical map and estimates, of the quantities of excavation and other work necessary to effect the object on the most favorable route of which the country was susceptible. At that time and through the whole

summer, the Des Plaines river was generally admitted to be unusually flush, as was also the Calamic. No gauges were therefore ordered, and consequently those of the Des Plaines, made by the United States' engineers in 1830, and of the Calamic, by Mr. Bucklin, were adopted as the basis of the investigation. Keeping in view, however, that the truth of these gauges had been strenuously controverted by the advocates of the upper level or "shallow cut," and that the capacity of the Calamic had been contended to be even superabundant, the attention of the examining engineer was particularly directed to the question, whether the Calamic could in any event be classed among waters which the law contemplated as *'sources within the legitimate authority of the State of Illinois;"* a question which his reputation for sound judgment in every thing connected with canaling, his knowledge of the requirements of Indiana dependant on the Calamic, and his great experience in the adjustment of similar claims, pre-eminently fitted him to answer with confidence. His plain, free, and very decided report, marked G, to which Mr. Burnett's is appended, will afford all the information required by the statute which enjoined the examinations. But notwithstanding the opinion of the Commissioners, that the report of Judge Wright—so completely confirming their original plan—should alone determine the mode of feeding the canal, they still thought it advisable to seize the first opportunity of reguaging the summit streams and examining the suitability of the country for sustaining assistant reservoirs. The past dry season rendered the measuring of the Des Plaines almost unnecessary, since for nearly four months the tightest dam that could be erected would not, at the point for taking out a feeder, have saved water enough to propel a single pair of ordinary mill-stones. Repeated guagings from the 20th of July to the 22d of August, and it was afterwards still lower, gave an average of less than the measurement of 1830. The Calamic was guaged on the 8th of August, and again on the 21st of September, by Mr. Talcott, the competent and indefatigable resident engineer of the summit division, under the superintendence of the chief engineer and two of the commissioners, who assisted in the operation. Every precaution was taken to render the measurements perfect, but owing to the high stage of water in the lake which flowed back upon the only point adapted to the purpose, and the quantity of grass that had recently grown up in the bed of the river, it was impracticable to compute the velocity of the current from top to bottom with all the precision that was desirable. Averaging the different guages, which are believed to be over the truth, the quantity estimated was a fraction less than 7,000 cubic feet per minute, being only 1,600 feet more than reported by Mr. Bucklin, but falling short 10,217 cubic feet per minute of Mr. Belin's estimate as given in the printed report. The inference is fair, therefore, that Mr. Bucklin was right, and conclusive that Mr. Belin was either wrong in his calculation, or, which is more probable, that the error was typographical. It is proper to mention also that the volume of water continued to decline for some weeks after the last guaging by Mr. Gooding and Mr. Talcott, but the general sickness of the country prevented a repetition of their experiments. An attempt was made on the 8th of October, when it was found that the river had fallen two inches since the last and lowest previous guage, but the measurement was carried no further. In regard to reservoirs, it is sufficient

to say that, besides their pernicious influence upon the health of such a country, it is believed that they could have rendered but little aid in a protracted drought like the one just experienced.

In addition to the services required by law, the commissioners availed themselves of the valuable talents of Judge Wright in general consultation. He was employed to inspect the entire line, and invited to criticise freely any and every part of the work in progress, as well as the plans of the chief engineer and of the Board, all of which were detailed to him on the ground with great minuteness. A number of written interrogatories were likewise propounded to him embracing every subject commented upon by the committee on Roads and Canals, in their report to the House of Representatives at the same session in which the examination was ordered. The report itself had attracted his attention before he arrived in the State. The answers to these interrogatories, and the result of the general inspection are embodied in a separate report to the Board, marked H; by which it will be seen that the present plan of the canal, being the same originally adopted, has received the deliberate sanction of one of the ablest, most experienced, and most distinguished engineers of the age. Nor was that sanction given until after the most patient scrutiny both of the plan itself, practically examined, and of all the published discussions and animadversions on the subject. Since that report was obtained, the operations of another year, wide and varied in their range, develope nothing but additional confirmation. The fifteen sections extending from Chicago river to the "Point of Oaks," eight miles, and lying through the low wet prairie periodically flooded by the Des Plaines river through Mud lake, have been completely defended against any possible danger from surface water; and are now, by means of those defences, accessible and tenable at any season of the year. The same plan of drainage and defence is gradually progressing from the "Point of Oaks" to the Saganaskee swamp, and enough has been done to inspire the fullest confidence in the practicability and moderate cost of the work. Much less rock will be encountered than was once supposed, but the earth excavation will in some few instances cost a shade more than the estimates. The quantity of water to be pumped is not greater on an average than was anticipated; although there are several sections that will require stronger machinery for that purpose than the others. The same remarks will apply to the rock cuttings between the Saganaskee and Lockport, all of which have been permanently defended, and many of them so far advanced as to exhibit to the bottom every variety of material and every difficulty of excavation.

Through Lockport and thence through Juliet, many improvements have been made in the line. Symmetry and strength have been added; the value of the water-power exclusively belonging to the State has been much increased; and every advantage that plans and locations could secure to the State has been scrupulously observed. The revenue from the sales of lots and water privileges in and between these flourishing towns must ultimately be very large, as will also be the case at the passage of the Du Page river, where a manufacturing place of no little importance must soon be required to meet the exigencies of the country.

The costly and exposed sections around the base of the Kankakee

bluffs are in the hands of experienced contractors, who are known to have executed extensive and more difficult jobs on the St. Lawrence canal. The safety of the plan of construction is now generally conceded, and the prices at which the work was taken are fair. From this point to Marseilles nothing has been let; thence to Ottawa the work is advancing steadily, and will be finished in good time.

The navigable feeder from the Fox river, commencing at Green's mills and falling into the main canal at the town of Ottawa, and also a lateral canal and basin extending to the Illinois river, authorized in March, 1837, have been located with due regard to the enhanced value of the property of the State. The entire feeder, about five miles long, and a considerable section of the side cut have been placed under contract, and will probably be so far advanced in another year as to render available the large and valuable water-power thus to be introduced into the heart of the town. These judicious improvements, ordered at the last regular session of the Legislature, cannot fail to advance the prosperity of Ottawa in a high degree. Strengthened and cultivated as her natural advantages now are, it is admitted by all intelligent observers that she must soon become an important manufacturing city, creating a vast amount of business for the canal, diffusing incalculable benefits through an extensive scope of country, and remunerating the State, by increased value of property, more than threefold the amount of the additional expenditures. Several mill sites might now be profitably sold at Juliet, where they are much needed for general convenience, but the Board have no authority to sell or lease such privileges on any part of the line. The power is indispensably necessary, and should be conferred on the commissioners or some other agents at the present session of the General Assembly.

From Ottawa to the termination of the canal at the city of La Salle, the work, except the basin and steamboat channel, is progressing as rapidly as was expected. Several sections have been received, and many others will be ready for delivery early in the coming year. The channel and basin will be pushed with vigor on the opening of the next season, and, if labor can be commanded, they will be in time for the remainder of the third division, which it is believed may be brought into use in the spring of 1841.

The principal part of the aqueducts, locks, dams, and culverts of the middle and lower divisions, have been undertaken by practical mechanics, skilled and experienced in their line of business; and, at the instance of Judge Wright and Mr. Gooding, a superintendent of established reputation has been employed by the Board to keep a vigilant watch, and see that the laying of every stone is in accordance with the specifications of the contract. By this means uniform and permanent structures may be expected.

Good stone, conveniently situated and carefully tested, has been found in sufficient abundance; and water lime or Roman cement, of the most superior quality, lies in inexhaustible beds scattered along the line from Lockport to the Little Vermilion river. An improved furnance for calcining and a steam-mill for grinding the lime, will soon be put in operation at Lockport, by Messrs. Norton and Steele, a firm from Canada, who manufactured principally for the St. Lawrence canals, while under the control of Judge Wright. The commissioners have contracted with

these gentlemen for a supply of the article at fifty cents per bushel, deliverable at the respective structures, and subject to the inspection of State agents—terms believed to be unusually favorable.

The fourth section of the canal law of 1837, requires the Board of Commissioners to cause a survey and estimates to be made, as soon as convenient, of the route of a canal diverging from the main trunk, through the Saganaskee swamp and Grassy lake, to intersect the Calamic river at the nearest practicable point, and to construct the proposed branch whenever the State of Indiana shall have undertaken a corresponding work connecting her system of internal improvements with the Illinois and Michigan canal. In compliance with this requisition, a party, under the direction of Mr. Burnett, was ordered to that duty as early as preparations could be made. The season being one of extraordinary wetness, examinations and estimates could not be as accurately made as it was desirable they should be. But the commissioners, accompanied by the chief engineer, continued to explore the route until they realized their anticipations of the facility and cheapness with which an excellent canal might be constructed, uniting at once great public convenience and utility with a profitable investment of capital. Completed at a cost of not more than three hundred thousand dollars, it will connect the Illinois and Michigan canal directly with Lake Erie and all the artificial navigation of Indiana and Ohio; and it is thought that the water-power, together with the town which it will create on State property, will more than reimburse the outlay. For the particulars of the survey, see Mr. Burnett's report, marked J. Major Lewis, one of the acting commissioners, and Mr. Williams, the chief engineer of the Indiana canals, have verbally expressed their opinions to this Board, that Indiana would certainly accept the invitation of the State of Illinois, and meet her at the dividing line; but, as yet, no written communications have been enterchanged. It is highly probable, however, that some step will be taken by Indiana, at the present session of her Legislature, which may demand immediate action on the part of this State. It is therefore proper to inquire whether the existing laws confer the power on the Board of Commissioners to commence the prosecution of the work. It will be perceived that the fourth section of the amendatory act for the construction of the Illinois and Michigan canal, approved March 2d, 1827, after authorizing a survey and estimates, uses the following words: "the said work *to be constructed* whenever the State of Indiana shall undertake a corresponding work connecting her system of internal improvements with the Illinois and Michigan canal." The work is ordered *to be constructed*, but the ways and means are not pointed out. No doubts are entertained that the power was intended to be conferred, and that it was designed to appropriate the necessary means out of the canal fund; but the sixth section of the law of January 9th, 1836, says: "the money borrowed, the premiums arising from the sale of any stock created, the proceeds of the canal lands and town lots, and all the moneys in any way arising from the contemplated canal, shall constitute the canal fund, *and shall be used for canal purposes, and for no other whatever*, until the said canal shall have been completed." The words, "*for canal purposes*," taken with the context, would seem to mean, *for the purposes of the Illinois and Michigan Canal.* If so, a more explicit appropriation should be made.

The enlargement of the natural basin at the confluence of the north and south branches of the Chicago river, authorized by the 7th section of the law of 1837, will be commenced sometime during the approaching summer, unless a scarcity of labor should cause other work to be delayed by the commencement of that. The exchange of block number 14, the property of the State, for block number 7, belonging to individuals, has not been effected; and it is the opinion of the commissioners that it will be decidedly to the interest of the canal fund to condemn block number 7, for removal, and sell fourteen, after the basin shall have been enlarged.

The three commissioners appointed by the circuit judge of the seventh judicial district to value private property, required for the construction of the canal, have attended, at the instance of the Board, on two occasions. At their first meeting all were present, but at the second only two appeared, when it was contended by counsel, and sustained by the court, that the law made no provision for any number less than three to act. The death of one of them occurred soon afterwards, and application being made by the claimant for the appointment of another, the judge decided that no power was anywhere vested for filling vacancies. These defects in the statute should be removed by amendment.

The agents for the protection of canal lands have been less successful than was reasonably expected. Depredations, though not so frequent as formerly, continue to be committed with shameful impunity, arising in some degree, from the difficulties of obtaining such evidence as will satisfy a jury. Some few judgments have been obtained at considerable cost, but chiefly against irresponsible persons. The commissioners continue of opinion, however, that the agency has been beneficial far beyond its expense. Firm and vigilant men may yet arrest the lawless and dishonest practice of plundering lands devoted to so great an object; and this belief finds strength in the good effects which were produced by the activity and fearlessness of Col. William Weatherford during his short period of service. It is nevertheless due to a large a respectable portion of the inhabitants of that section of country to say that public sentiment has undergone and is undergoing a wholesome change in respect to the propriety of enforcing the laws against all trespassers. If the agents do their duty, they will find many influential citizens who are ready to aid and support them. Such assurances have repeatedly been made to the Board by persons in whom every confidence can be reposed.

The act, passed in July, 1837, providing conditionally for the sale of canal lands to the amount of four hundred thousand dollars, made it the duty of the commissioners to select the lands intended to be sold—to subdivide them into lots of not less than forty nor more than eighty acres—and to value them in reference to many considerations. To comply with these injunctions, it became necessary to employ agents of suitable qualifications for the collection of proper information. Mr. Richard G. Murphy, of Perry county, and Col. John Flemming, of Shelby, were invited to undertake the laborious task; and it affords the Board much pleasure to be able to say that, as far as these gentlemen progressed, they performed the duties assigned them with unremitting industry and much skill. Attended by Mr. Preston, an excellent surveyor, they examined minutely, and in regular order, each section of canal land, establishing its corners and taking

tabular notes of the quality of soil—the quantity and description of timber—the size and character of streams—the amount of improvements, if any—the location of those improvements—and many other items of information highly useful for present and future purposes. A correct knowledge of these things was deemed indispensable to the Board, in order not only to select the lots to be offered, and graduate their value generally, but to guard against being overreached in selling an extraordinary tract of land for an ordinary price. It is to be regretted that the party was dispersed by sickness before the object was accomplished; but the work will be resumed and finished as early as it can be economically done; and if the pecuniary condition of the people will justify it, the lands authorized to be sold, or a part of them, will be brought into market in June or July.

The sixth section of the act of March 2d, 1837, empowers the Board of Commissioners to sell such parts of the canal lands in the township in which Chicago is situated, and alternate lots in La Salle and other towns along the canal route, as might be necessary to produce the sum of one million of dollars. Under this authority, and since the last session of the Legislature, a few alternate lots have been sold in Lockport, in Ottawa, and in La Salle, but more with a view of founding the towns and preventing individual property from superceding that of the State, than for purposes of present revenue. The financial embarrassments of the Union for nearly the last two years will satisfactorily account for no other property being sold. The sales at the places enumerated, amounting in gross to $35,400, were effected at liberal prices considering the times, and almost exclusively to actual settlers who are making substantial improvements. The Treasurer's and Secretary's reports contain specific accounts of sales.

This rapid review of the condition of the canal and the affairs connected with it, taken alone, would probably be thought insufficient; but in conjunction with the appended reports from the Treasurer and Secretary, and from the principal, the resident, and the examining engineers, it will be found to embrace as much as could be said on the subject without repeating information which others had detailed with perspicuity.

It appears from the estimates of the chief engineer, as will be seen by an examination of his report, that according to the contracts made, adding a full allowance for the light sections not under contract, the sum of $7,621,442 57 will cover, with very little variation, every expense for a convenient, substantial, and elegant canal, such as it ought to be for commercial economy, durability, and State character. The original estimate of the same engineer, exclusive of the additions at Ottawa and the enlargement of the basin in Chicago, was $8,654,337 51, being $1,032,894 94 more than will be required to complete the work.

Upon a result so important to the people, and, under all the circumstances, so gratifying to the Board, the Commissioners cannot refrain from tendering to your Excellency their warmest congratulations.

It is the deliberate opinion of the Board that the canal may be finished in four years, if there be no delay on account of funds. The money already consumed amounts to $1,432,445 43, of which $986,355 85 were disbursed in the last year; and but for the well known awful visitation of Providence, this sum would have risen to $1,200,000. The operations

for the year 1839 will require an additional appropriation of a million and a half of dollars, and those for 1840, two millions. A small part of these sums may possibly be derived from sales and collections, but to rely on that source beyond the interest to be paid on loans, would be a questionable policy.

In conclusion, the commissioners reiterate the opinion, expressed in the first annual report to the Governor, that "if these lands and town lots be very gradually and cautiously brought into market, reserving the chief part until the canal shall have been completed, and all its advantages clearly understood, there is more than enough to build it on the present capacious and permanent plan. But, on the contrary, if sales be forced and all the lands be disposed of before their true value be known, there cannot fail to be a deficit of several millions of dollars. Many tracts of land, that would not bring more than five or six dollars per acre if sold immediately, may be worth, a few years hence, from twenty to one hundred dollars. Innumerable instances of the kind might be adduced, some of them in the vicinity of the canal."

All of which is respectfully submitted.

W. F. THORNTON,
Late President.
JACOB FRY,
Acting Commissioner.

CANAL OFFICE,
Lockport, December 10, 1838.

To the BOARD OF COMMISSIONERS
of the Illinois and Michigan Canal.

GENTLEMEN: In pursuance of the duties assigned me, I have the honor to submit the following report.

Since my last annual report to your Board, (a copy of which accompanies this,) the work upon the canal has progressed with as much rapidity as could reasonably have been anticipated, considering the obstacles presented. Notwithstanding the unfavorable weather of last winter, the high water of last spring, and the sickness during the past summer and fall, there has been a large amount of work done, and this amount would probably have been increased at least $300,000, but for the sickness. The weather during the summer and fall has been remarkably favorable for canal operations, and particularly for protecting and preparing portions of work upon the summit division for further progress.

The part of the line from the south branch of Chicago river to summit or the Point of Oaks, is now placed in such a situation as to insure its safety from the high water caused by the overflowing of the Des Plaines river.

This has hitherto been the cause of much trouble and delay, and occasioned, for a considerable length of time, an entire suspension of the work. A small part of the deep-earth cutting in the valley of the Des Plains, between summit and the Saganaskee, has also been protected, so

that the work may be successfully prosecuted during the seasons of high water. Upon this part of the canal, the contractors have spent most of the past season in making preparations for a more vigorous prosecution of the excavation, such as building shantees, providing the necessary fixtures, grubbing and clearing, &c.; so that the amount of estimates upon work done is very trifling, compared with that which remains. It should be observed, too, that several of the sections have been relet since the regular letting in June last, and the contractors have not yet had time to make full preparations.

The location of the canal at the Saganaskee swamp and the plan of constructing it have been materially changed since my first estimate was made, and a very decided advantage gained in the expense, in the symmetry of the line, and in the increased value of State property. The canal as now located occupies as much of the channel of the river as can be made available upon a straight line. A new channel for the river will be opened upon the west side of a low island or peninsula, which extends the whole length of sections number 42, 43, and 44, and will occupy nearly the same place where the main channel of the river appears once to have been. An embankment will be made, connected with the spoil-bank on the west side of the canal at the lower end of section number 41, (which is just above the Sag, and near the present channel of the river,) crossing the river from that point to the island, and running thence across the island to a bayou, which will form a part of the new channel; thence parallel with the canal and about 22 chains from it, upon the west side of said island, to a point near the lower end of it; and thence across to the canal upon section number 45, where it will be connected with the protection so as to exclude the waters of the river. Parallel with and near the embankment upon the west side of the island, the artificial channel will be made so as to unite the bayou above mentioned with one that extends up from the lower end of the island. This channel will be opened 200 feet wide, and all the earth excavated from it deposited upon the island side. It is believed that a depth of excavation sufficient only to remove the roots will be all that will be necessary; for the whole river being forced into the channel by the embankment above described, will cause a current sufficiently strong in time of floods to deepen and enlarge it to the requisite dimensions. There is a large, deep basin, or expansion of the river below the channel, of sufficient capacity to hold all the deposite that can be washed into it.

That part of the canal embraced in sections number 42, 43, and 44, the only sections upon the Summit Division, except two, which are not now under contract, has been very properly withheld from contract since the above described change was made. The only work that can be done upon it to any advantage, previous to the completion of the sections from number 44 to the running out of the level, consists of earth excavation under water, which it is believed can only be done, with economy, by a dredging-machine. Such a machine your Board has very properly determined to build, under the direction of an efficient agent of the State, who should also superintend its operation when completed; and it should be in readiness as early next season as practicable. With this machine, all the work upon the three above mentioned sections, except a small amount of rock excavation and walling, can probably be performed by the time

that the sections below will be finished. These once done, the water can be drawn down so that the rock excavation (which occurs only upon section number 44,) and walling, can be performed with little difficulty or delay.

When the canal at this point is completed upon the present plan, a quantity of State land, amounting to about 270 acres, will be reclaimed, which is, at present, entirely valueless. The whole of the impassable marsh that now presents so forbidding an appearance will be made *dry land.*

The junction of the canal from Calumet river with the main line, being made at this point upon the reclaimed State land, will make it one of the most valuable town sites upon the line of the canal, or in the State. The importance of the point at this junction will be appreciated when it is understood that the "lateral canal" is the last link in a chain of canals of nearly *twelve hundred miles* in length which will, by this, be connected with the improvements of our own State. All these canals are believed to be in progress, and some of them are known to be nearly completed, and the whole chain will probably be completed in three or four years. To those who have not watched the progress of improvements in neighboring States, this statement may appear almost incredible, and the following list is, therefore, given to show that there is no exaggeration.

	Miles.
Length of Michigan and Erie canal, including both the branch to Michigan city and to the Illinois State line, (all in Indiana,)	198
Wabash and Erie canal, in Ohio and Indiana,	315
Central canal, Indiana,	310
Cross cut canal, Indiana,	43
Miami canal, Ohio,	205
White Water canal, Indiana, (length of Richmond branch estimated,)	90
Canal from Cincinnati to Harrison, on the White Water canal, (length estimated,)	30
Total	1,191

There are several navigable feeders omitted, which would probably increase the length thirty or forty miles.

The canals above ennumerated are intersected at various points by railroads and other improvements, which will add much to their usefulness, and materially increase the importance of a connection with them.

From section number 44 to Lockport, (a sub-division that embraces all the heavy rock excavation,) the line has been permanently protected from the river floods, with the exception of sections 45, 46, 47 and 48, a part of which only requires protection, the rest being above the highest floods.

When this work was first placed under contract, it was supposed that all the protection against high water that would be required for the canal after its completion would be made by the contractors for their own security during the construction; or that, if any further defence were required, it could be made with greater economy after the canal was finished. But the unusual floods of last year rendered it evident that a strong

and permanent defence must be made to prevent the influx of the water into the canal: and the serious delay occasioned to the work by the want of such a defence, and the probable recurrence of such delay, satisfactorily proved the expediency of at once making a protection or defence at the expense of the State, which should be sufficient for all present and future purposes. This protection consists of two parellel stone walls, three feet apart, raised one foot above high water mark, and a wall of well puddled clay between them, extending down to the firm rock beneath, and as high as the top of the parallel walls.

The Sag and Big run ditch, extending from section number 45 to Big run, commenced last year, has been completed. The object for which this is designed was explained in my last annual report.

The cost of the protection and ditch forms no inconsiderable item of expense, but could not be dispensed with, without causing much delay during the construction, and materially detracting from the value of the canal after its completion.

Much labor during the season past has been spent upon the above mentioned work, but as the former is nearly, and the latter entirely completed, the whole force that can, in future, be brought upon the work, may be directed exclusively to the excavation of the canal.

The work upon the Summit Division, during the past season, has generally been well applied, so that the sections that have been worked upon to any considerable extent are now, with but few exceptions, in a good condition for future operations. Portions of many of the sections upon this divission have been worked to bottom, and several of them will probably be completed in the course of next year.

An improvement has been made in the plan of constructing sections number 66, 67 and 68, by building dry walls in front of the embankment, which will somewhat increase the cost, but add greatly to the value of State property and the durability of the canal, and diminish the expense of repairs.

In connection with section number 68, which passes through the town of Lockport, and is made 120 feet in width, a hydraulic basin has been estimated, which is to be constructed in such a manner that the mills or manufactories which are to be operated by the water-power created here, will be built upon, and draw their water from, three sides of it—the other side being next the canal and only separated from it by the towing-path, a street, and a tier of warehouse lots. This basin will be connected with the canal in such a manner that boats or vessels can readily pass into it, and load or unload at the mills and warehouses.

The water will be used here for the descent of the first two locks, (which are of ten feet lift each,) though the second lock is located about a mile below the first. A tail race can be made from the mills upon ground of such a level as to require but light rock cutting, except for a short distance, and the water carried in below the second lock.

The value of the water power created here and at other points upon the canal, by drawing a supply of water directly from lake Michigan, can be fully appreciated after a season of such severe drought as the past. The Des Plaines river and many other considerable streams of the country have been nearly dried up, and probably three-fourths of the water-mills throughout a large portion of the United States have been standing

still for the last three months. But had this canal been completed, there would have been, during the season past, an unusual supply of water, as the surface of the lake has been *nine feet four inches* above canal bottom, or *three feet four inches* higher than was originally calculated upon for the supply.

The line from Lockkport to Dresden, a short distance below the Kankakee bluffs, was prepared for letting last spring, and offered for contract on the 5th of June. All the work offered was let, and at such prices, generally, as were satisfactory. Some of the lowest priced work, however, has since been abandoned and relet.

In revising the line for letting, the canal was made very nearly straight for the whole distance from Lockport to Juliet. This location varied considerably from the first survey upon which the estimate was originally made, and the locks are quite differently distributed. The first two locks are, as before mentioned, about a mile apart—the first in the lower part of the town of Lockport, and the second, or lock number 2, just below Fraction run—both upon canal land. Locks number 3 and 4 are located upon canal land, about 2¼ miles below Lockport. The lockage is twenty feet, and the same amount of water-power will be created here as at Lockport.

Lock number 4 brings the canal to the level formed by the pool of dam number 1. A short distance below said lock, the line runs into the channel of the Des Plaines, which will here be turned to the right, and the whole of the water forced into the channel upon the west side of Norman's island.

The rock excavation in the bed of the river, from the point where the canal enters it to the upper end of said island, averages about two and a half feet in depth; but when the river is turned, the excavation will be attended with no particular difficulty. The excavation continues across the island, running out at the lower end of it, where the towing-path crosses the river, and is thence continued down the right bank to the guard-lock at dam number 2, where the independent canal again commences. From this point to the termination of the canal, the towing-path is upon the left or south side.

From Norman's island to dam number 1, which is located upon canal land, just above the town of Juliet, two strong walls, with embankments between them, will be constructed upon the east side, to confine the water in the pool of the dam. It is proposed to raise these walls and embankments seven feet above the comb of the dam, to be perfectly secure from the highest floods. From dam number 1 to dam number 2, a similar defence will be required, but of a much less height.

Both dams will be made of good cut-stone masonry laid in hydraulic cement. Dam number 1 will be connected with lock number 5, which will be upon the west or towing-path side. Here also a large amount of water-power will be created which, at this point, will be particularly valuable, and confer great additional value upon State property.

From Juliet to the Du Page, the revised line varies considerably from the former surveys. This variation was made in order to keep up the level between five and six feet higher than formerly, so as to cross the Du Page by an acqueduct. This will somewhat increase the cost, but make a much better and safer canal. The increased cost will be principally upon

the three or four sections immediately below Juliet, and in the aqueduct across the Du Page, which will cost more than the original plan of crossing this stream in the pool of a dam. The plan was changed after witnesssing the floods of the last two years, and being fully convinced that more would be gained by it in safety than would be lost in expense, if, indeed, the increased expense is not more than compensated by the additional water-power that will be given upon the State land at the Du Page. This State land will form a town site of no inconsiderable importance, being beautifully situated in the heart of a fine country, at a considerable distance from any town that could possibly rival it. The lockage immediately after crossing the Du Page will be fifteen and a half feet, divided into two locks, number six and seven, and it will be necessary to draw about 4,500 cubic feet of water per minute past these locks, (exclusive of the lockage water,) to supply the canal to Marseilles.

A feeder will be taken into the canal from the Du Page, about three miles above the crossing. The last season has shown this stream to be one of the most permanent in the State, and it can be introduced as a feeder at a very moderate expense.

The length of the feeder will be twenty chains, and an embankment is already nearly completed, extending from the head of the feeder up the river twenty-seven chains, and connecting with high ground upon the river bank This embankment, together with that which will necessarily be formed in the construction of the feeder, will exclude the flood waters of the Du Page from a depression through which they formerly flowed into Rock creek. This defence not only secures the safety of the canal, but prevents a considerable quantity of excellent land from being overflowed.

From the Du Page to Dresden, the line has been but slightly changed since the first survey, but the quantity of slope-wall to protect the canal at the Kankakee bluffs has been considerably increased, to render the canal doubly secure at this exposed point.

The cost of the canal around the bluffs, at the present contract prices, will not vary materially, in the aggregate, from the original estimate; and the contractors are men of responsibility and much experience in similar kinds of work, so that its completion at present prices is beyond a doubt.

It will be seen that, in many particulars, the canal from Lockport to Dresden is very much improved from the original design. In addition to other improvements, between five and six miles of the canal below Lockport will have walling either upon one or both sides, which will effectually prevent the washing of the banks or any serious danger from breaches. This mode of constructing the canal has been adopted every where that stone of a suitable quality could be conveniently obtained in the excavation, and on portions of the distance abovementioned, stone is quarried for the express purpose.

These improvements in the mode of construction, and others upon various parts of the line which will in some degree increase the cost, have been the more readily introduced in consequence of an important saving in expense upon other parts of the canal, which it was known would reduce the aggregate cost considerably below the original estimate.

The line from Dresden to Marseilles has not yet been prepared for

letting, but this should be done as early next spring as practicable, and the whole of it placed under contract. The estimate for this part of the canal will be the same as in my first annual report.

From Marseilles to the western termination of the canal, but particularly below Ottawa, a large proportion of the earth work has been finished. Only six sections upon the main line, and one upon the Fox river feeder, have been entirely finished and accepted, but ten or twelve sections more are nearly done, and might have been completed in October had not sickness caused a serions interruption in canal operations.

The work upon the Fox river feeder is so far advanced that it may be completed, without difficulty, next season. The dam at the head of it is finished, except a small amount of masonry to raise the abutments to the requisite height, and the guard-lock will be done next spring.

Several changes in the original plan of constructing portions of the Wester nDivision have been made with a view to greater permanency and utility, or to benefit State property. The change in the canal at Ottawa, for the purpose of benefitting the State property in that place, increased the cost of construction about $12,000, but will enhance the value of the property to a much greater amount.

At Pecumsagan creek, a much more expensive and better artificial channel has been formed than was at first deemed necessary. An extraordinary flood, in Jnne last, destroyed a considerable amount of work already done, and showed the necessity of increasing the expenditure to give additional security to the aqueduct to be built across said channel.

There having been some injury sustained upon the heavy embankments from section number 191 to 195, in consequence of strong winds during a long continuance of high water, it was thought expedient to protect the banks that were most exposed by a slope wall. Accordingly the whole of section number 194, and parts of sections 193 and 195, have been thus protected, and the whole will probably be made secure before the spring floods.

The width of the steamboat channel has been increased, for a distance of 600 feet below the basin, to 160 feet on the bottom, or 60 feet more than it was first estimated. A similar enlargement has also been made for a short distance above its entrance into the Illinois river.

Wherever an improvement upon the original plan, increasing the cost over the original estimates, has suggested itself during the progress of the work, the facts have been communicated to your Board, and I have had the satisfaction to find that it has been deemed more important to increase the permanency, utility and symmetry of the canal, and the ultimate value of State property, than to keep the cost in every instance within the original estimates. It is well known that when those estimates were made there had not been sufficient time given to mature plans, or determine, in all cases, the nature of the material that would be met with in the execution of the work. It was my intention to make my estimate high enough in the *aggregate*, but it was *not* expected that in all its details it would exactly correspond with the actual cost.

Such full developments have now been made upon nearly all the work which has been placed under contract, that its character is pretty well ascertained.

The contracts made the past year have generally been made with experienced contractors, after they had satisfied themselves of the true value of the work by actual observation of similar work then in progress, and had had the benefit of their own or other contractors' experience upon the same canal for the two years previous. These contracts have been made, in most cases, at prices below the original estimates for the same quality of work, and, with very few exceptions, will undoubtedly be executed at the prices, and afford a fair profit. If relettings become necessary, the work generally will be relet without an increase of prices. This opinion has been confirmed by observation and the relettings that have already taken place.

The character of the deep-rock cutting, about which such a diversity of opinion prevailed at the commencement, is now as clearly understood as that of the light earth work. All the sections have been commenced, and considerable portions of many of them excavated to bottom, showing every variety of rock that can be supposed to occur in what still remains. These developments have reduced the cost of this portion of the canal to as much certainty as it is possible to arrive at before its completion. Heavy contracts have been taken by responsible contractors, for less than the original estimates, upon *quarried rock*, and those contracts, (since the first season,) have, in *all cases*, been for embodied rock, whether stratified or solid. Were the whole of the rock excavation upon the Summit Division to be offered for contract again at this time, it could, unquestionably, be let to contractors of the highest responsibility for considerably less than the amount of the present contracts.

The principal structures of masonry upon the canal have nearly all been placed under contract the past season, and a commencement made by quarrying and cutting stone. Twelve out of the fifteen lift-locks upon the canal have been let; also two stone dams and a guard-lock at Juliet, the masonry in the abutments and piers of the Fox river aqueduct, and two culverts—one of sixteen and the other of eighteen feet chord. The masonry in the Fox river aqueduct was awarded or let in the fall of 1837, but no commencement having been made, it was relet in June last.

The locks will cost less and the aqueduct more than the original estimate. The quality of the work in the Fox river aqueduct has been changed from hammer-dressed to cut-stone, and in the locks it remains the same as was originally intended.

Since the work was let, quarries have been opened along the line and near it, and stone of a very good quality has been obtained. *Water lime* is also found in inexhaustible quantities at Lockport, and in several places upon the Western Division of the canal; and as a contract has been made with a gentleman of undoubted responsibility for the manufacture and delivery of the lime at the places where it is to be used, the cost may be calculated with certainty. All the contracts for masonry, except for the Little Vermilion and Pecumsagan aqueducts, and the guard-lock and dam abutments at the head of the Fox river feeder, were made for so much, *exclusive* of the water lime, which was to be furnished by the State. This was done, first, to secure lime of good quality and procure it in time; and, secondly, because when the contracts were made it was not known where it would be obtained, nor at what cost.

The materials that will be obtained for the masonry throughout the whole extent of the canal can be had more conveniently, and of much better quality than was anticipated at the commencement; but in consequence of the delay caused by the sickness of the past season, it will probably require two seasons more to complete all the masonry which is under contract. By placing the remainder of the work of every description under contract next spring, or early next summer, the canal may be completed, in three years, from the deep-cut to the western termination, unless the seasons should prove more than usually unfavorable. To accomplish this, and proceed at the same time with a force upon the Summit Division sufficient to complete it one year later, will require a great additional number of laborers. These might easily have been obtained, had the country through which the line of canal passes proved as healthy the past as the two preceding years. But unfortunately for the credit of the canal, it has been otherwise. There has been much sickness upon this canal, as well as almost every other public work in the west. This may probably be attributed to the long continued and intense heat of the summer, and the severity of the drought. But from whatever cause it may have proceeded, it was unusual, and will not be likely soon to occur again. The two preceding years, since the commencemeut of the canal, had been remarkably healthy, and there is no reason to doubt that succeeding seasons may prove equally favorable.

When the sickly season commenced in July last, the force upon the canal was rapidly accumulating, but the sickness in August and September not only discouraged the laborers abroad from coming here, (for exaggerated reports of the unhealthiness of the country were every where circulated,) but caused many that were here to leave the country altogether, or to engage upon other public works of the State. Since these discouraging circumstances occurred, several of the contractors have exerted themselves to introduce men upon their work at their own expense, and have expended considerable sums of money to effect this object. Their exertions have been attended with some success, but it is feared that they will not derive that advantage from the introduction of laborers that their praise-worthy zeal deserves, in consequence of the difficulty of keeping these laborers upon their work after they have been once obtained. It is respectfully suggested whether the State's interests would not be materially benefitted by making a liberal expenditure of money in obtaining laborers from a distance for the canal, either directly through an agent of your Board, or by co-operating with contractors. Much effort will, at all events, be necessary on the part of contractors, and the friends of the canal generally, to correct the misrepresentations that have been made in relation to the sickness, to show the liberal wages uniformly paid upon this canal, and the advantages that this country presents over almost every other for the investment of their earnings.

The number of laborers upon the canal and connected immediately with canal operations during the past year, as nearly as can be ascertained from the returns made upon each sub-division at the close of each quarter, has been as follows, viz:

1st quarter ending February 28th - - -	790
2d quarter ending May 31st - - -	1,755
3d quarter ending August 31st - - -	* 2,193
4th quarter ending November 30th - - -	2,114

From the number of men now engaged it is very evident that several hundred have left the canal since last summer. There are many, however, who still continue upon the line, that have not yet recovered their strength sufficiently to labor, and therefore are not included.

The amount of work done upon the canal during the past year is as follows, viz:

1st quarter ending February 28th - - -	$109,417 62
2d quarter ending May 31st - - - -	167,128 67
3d quarter ending August 31st - - -	409,374 33
4th quarter ending November 30th - - -	227,741 93
Total in 1838 - - - - -	$913,662 55
Total in 1837 - - - - -	346,899 43
Total in 1836 - - - - -	† 35,744 83
Total amount of work done - - -	$1,296,306 81

This statement will show the progressive increase of labor from the commencement up to this time. It will be seen that but a small amount of labor was performed last winter and spring, in consequence of the unprotected state of the work; and that the amount during the last quarter, instead of being a great increase upon the summer quarter, as in 1837, shows a vast decrease, in consequence of the cause already explained.

The amount of work let upon the canal at the public letting in June last, was as follows, viz:

Aggregate length of line let upon the Summit Division, exclusive of relettings, three miles and 28 chains.

Total amount at estimates - - - -	$369,771 58
Total amount at contract prices - - -	366,199 96
Total amount less than estimates - - -	$3,571 62

Aggregate length of line let upon the Middle Division, twenty-one miles.

Total amount, (including structures) at estimates -	$1,145,329 93
Total amount at contract prices - - -	1,091,722 12
Less than estimates - - - -	$53,607 81

* The number of laborers on the first of August was probably 3,200.

† The amount paid, instead of the amount of work done, was given in my first annual report.

Structures upon the Western Division.

Total amount at estimates - - - -	$215,705 92
Total amount at contract prices - - -	194,549 84
Less than estimates - - - -	$21,156 08

Aggregate length of line let during the year, exclusive of relettings, twenty-four miles and twenty-eight chains.

Total amount at estimates, including structures, -	$1,730,807 43
Total amount at contract prices - - -	1,652,471 92
Less than estimates - - - -	$78,335 51

Aggregate length of line now under contract, including all which has been let, seventy-seven miles and forty-three chains.

Total amount, at present contract prices, including every description of work which is under contract, $5,871,740 37.

Aggregate length of line not under contract, twenty-four miles and four chains.

Total amount of work to be let, including all the work of every description which is not now under contract, $1,251,103 15.

Total amout of work under contract - -	$5,871,740 37
Total amount of work not under contract -	1,251,103 15
	$7,122,843 52
Add seven per cent. for superintendence and contingencies - - - - - -	498,599 05
Total cost - - - - - - *	$7,621,442 57
Original estimate - - - - -	8,654,337 51
Difference - - - - - -	$1,032,894 94

There has been a constant effort, on the part of some of the *pretended friends* of the canal, to make it appear that the estimate submitted in my first annual report was far too low. It has been stated, even during the past summer, in some of the newspapers of this State, (and consequently considered as an established fact abroad,) that the friends of the canal now *generally admit* that the canal will cost *much more* than this estimate. But this is far from being the fact. *None* of the friends of the canal, who can have any just pretensions to a knowledge of the value or cost of the work, ever made such an admission. On the contrary, when it was discovered that a much greater quantity of rock excavation had been estimated upon the Summit Division than would be found, the canal was *known* to have been over-estimated, notwithstanding considerable additional improvements were made upon other parts of the line in consequence of this saving.

* The cost of the Ottawa side-cut which was not included in the original estimate, is embraced in this.

In submitting an estimate of the cost of the canal as it now is, I am not governed by my own judgment alone, or that of other engineers. A very large proportion of the whole work, and all that was ever supposed to be of a doubtful character, is under contract, and much of it in the hands of men of great experience, sound judgment, and undoubted responsibility. They have generally taken the work at prices a shade below the estimates. All the work which is not under contract is estimated at prices at least as high as existing contracts, and no doubt is entertained that the work can be done as low as the estimates. Every item of work has been embraced which it is now supposed can possibly be necessary, in order, as nearly as practicable, to show the *entire* cost of the canal; but it is not pretended that any thing more than the *probable* cost can be shown until the whole work is fully completed. A variety of circumstances may occur during the progress of a work of this magnitude, which cannot now be anticipated, that may, in some degree, either increase or diminish the cost, but cannot cause a material variation from the present estimate.

The accompanying reports of Messrs. Talcott, Jerome, and Burnett, resident engineers, will give a satisfactory account of the progress and situation of the work upon their respective divisions. The tabular statements annexed to each will show the names of the contractors, the quantities and amounts of the various items of work performed at the prices allowed, the sections which are and those which are not under contract, and the aggregate cost of each section, embracing all the items whether at contract or estimated prices.

All which is respectfully submitted.

WM. GOODING,
Chief Engineer Illinois and Michigan Canal.

CANAL OFFICE,
Lockport, December, 1837.

To the BOARD OF COMMISSIONERS
of the Illinois and Michigan Canal.

GENELEMEN: Agreeably to your request, I have collected such facts in relation to the canal as my duty has led me particularly to observe; which I have the honor to submit in the following report.

Although the amount of work done upon the canal, during the year past, has not equalled the expectations of many of its friends, yet a great number of sections, embracing a vast amount of work, have been successfully commenced, and several of them on the Western Division nearly completed. The number of laborers has continued gradually to increase, and there are now as many upon the line as the contractors are at present prepared to receive. The want of labor that was so much felt last year and the beginning of the year 1837, and which for a time so much retarded the progress of the work, it is presumed, will not again exist. It is now generally known abroad that the country through which the line of canal passes is very healthy; that several thousand laborers may here find con-

stant employment for a number of years; and that no country in the world affords such advantages for the investment of the earnings of this class of men.

The number of laborers engaged upon the canal, on the first of December last, was not far from 350, and the force was not much augmented till the opening of spring navigation. There are now actually employed upon the canal, and in the various operations immediately connected with canal construction, about 1,700 men. This number might have been greatly exceeded, had not many of the contractors been negligent in providing tools and accommodations for the number of men requisite to progress with their work as rapidly as their contracts required. This delay was, for a short time, in some degree excusable, in consequence of the hard times and scarcity of labor; but where sections have been suffered to remain a whole season without being commenced, or where a commencement seems to have been made barely for show, and no reasonable assurance has been given of the ultimate prosecution of the work, from the progress already made, or from *visible* preparations commensurate with the magnitude of the job—there can be no doubt that the interests of the State will require a reletting as soon as efficient contractors, with the necessary means, can be found, who will take the work at fair prices.

On this as on other canals, many contractors have sought for and obtained more work than they can accomplish—some by overrating their means or ability, and some with the intention of selling out—they receiving the profits, and others performing the operations. Where such has been the case, and the contracts have been clearly forfeited, your Board may very properly effect a division of the work by reletting such sections as the original contractor cannot or will not prosecute, and allowing him to retain such an amount of work only as he can conveniently manage.

The amount of work performed during the year has been considerably less than it would have been but for the unfavorable weather that has so much of the time prevailed. The last winter was one of unusual rigor, and the wet weather during the spring, summer, and fall, without a precedent since the first settlement of the country. The streams for a great part of the year have been very high, particularly the Des Plaines river; but less interruption to the execution of the work has resulted from this cause than might have been anticipated from the unprotected state of most of the sections; and it has been clearly shown that a defence can be made, at a moderate expense, that will render the whole work perfectly secure during the highest floods. The high water in the Illinois river has been the cause of serious delay in the excavation of the steamboat basin and channel at the termination, and a large force will be requisite upon that work as soon as a favorable season for operations shall be presented.

The amount of work done on the canal, from December 1, 1836, to December 1, 1837, according to the monthly estimates, is as folllows, viz:

Upon the summit division - - -	$180,536 97
Upon the western division - - -	166,362 46
Total - - - - -	$346,899 43

Far the most important item of work embraced in the above amount, is the rock excavation on the Summit Division. Considerable progress has also been made in the deep earth excavation between Chicago river and the Point of Oaks, but there has been so much water upon the surface since the work was let, that the side ditch, which is to be formed on the south side of the canal without the spoil-bank, has not yet been finished; nor but a small part of the bank on the north side, which is to guard against the water that flows from the Des Plaines river in time of floods, and which is to be formed of the earth excavated from a ditch within the prism of canal.

On section number 1, several chains in length have been finished, and on other sections of this part of the line, portions have been sunk to bottom. On most of the sections of deep rock cutting which have been in progress during the year, small portions are now at bottom, so that the quality of both the rock and earth excavation through the deep cut is now well undersood. Enough has been done to fully demonstrate the character of the work, and show the ease with which it may be executed. Contractors, therefore, who have recently taken work, have done so with a better knowledge of the subject than could previously be obtained.

The estimate of a part of the Summit Division, contained in my report of last year, has fortunately proved much too high. A large portion of the excavation between the Point of Oaks and the mouth of the Saganaskee swamp was supposed, from the examinations made, to be rock, and estimated as such; but test-pits or shafts have this year been sunk, which show that the excavation will consist principally of clay and gravel, with a small portion of detached rock. Since this error in relation to the quality of the excavation was discovered, the work has been re-estimated, and much of it let at prices below the estimates. This error in my last year's estimate, which originated in consequence of a want of time to make the proper examinations, will considerably diminish the cost of the Summit Division.

During the past year, the greater part of the Middle Division has been carefully revised from Lockport to Juliet (and a survey made of the routes through Juliet) under the direction of Mr. Talcott, and the remainder under the direction of Lieut. Burnett, resident engineer, assisted by Messrs. Preston and Ryan. Some slight changes in the route of this portion of the canal have been made, though it remains essentially the same. The principal alterations are between Lockport and Juliet and the Aux Sable and Nettle creek. This division can now be readily prepared for letting, as very few other changes will be necessary.

A change was made in the line of canal opposite to, and for a short distance below Ottawa, on the Western Division, agreeably to instructions received from your Board, in order to enhance the value of State property at that place. The change was one unquestionably benefitting the State interests, but considerably increasing the cost of the canal. Work,

to the amount of $1,449 63, had been done on sections 168 and 169 upon the old line. These sections are now nearly completed.

From section 188 to 195, inclusive, a large quantity of heavy embankment has been made, and it is believed that the most of these sections (except the structures and the steamboat basin which is on section 195) may be finished next year.

The cost of some sections on this division, and probably on each of the others, will be greater than was anticipated before the quality of the work had been minutely examined. Rock, or a different kind of excavation from that which was estimated when the location was first made, sometimes occurs, and will, of course, increase the expense; but, on the other hand, many sections will cost much less than the first estimate.

It was supposed, when my report was made to your Board last year, that several causes might operate to reduce the cost below the estimates then made. One cause suggested was a more general attendance of efficient contractors, and consequently more competition; another, a reduction in the price of labor. Both of these causes have this season fortunately operated in favor of the canal. The two public lettings (on the 20th of May and 13th of November) were well attended by contractors of known skill and experience, and the work has been generally let below the estimates—partly, no doubt, because the character of the work was better understood, but partly because the price of labor has been so much reduced. The wages generally, for the year past, have been twenty dollars per month—six dollars per month less than the year preceeding.

The work that has been placed under contract the past year is as follows, viz:

Aggregate length of lettings on the Summit Division, exclusive of relettings, eighteen miles and twenty-five chains.

The amount at estimates - - -	$2,011,332 03
The amount at contract prices - - -	1,925,364 33
Less than estimates - - - -	$85,967 70

Aggregate length of letting on the Western Division, exclusive of the Fox river feeder, twelve miles and sixty-six chains.

The amount at estimates - - -	$186,200 36
The amount at contract prices - - -	187,143 18
More than estimates - - - -	$942 82

Length of the Fox river feeder, by the route finally adopted, four miles and thirty-five chains—all let.

The amount at estimates, including dam and guard-lock	$77,451 74
The amount at contract prices - - -	74,700 37
Less than estimates - - - -	$2,751 37

Aggregate length of line let during the year, including the Fox river feeder, thirty-five miles and forty-six chains.

The amount at estimates - - -	$2,274,984 13
The amount at contract prices - - -	2,187,207 88
Less than estimates - - - -	$87,776 25

Aggregate length of line now under contract, including the Fox river feeder and the lettings of the year 1836, fifty-two miles and three chains.

The amount of all the work let at contract prices	$3,244,234 97

All the Summit Division, except twelve sections, and nearly all of the Western Division below Marseilles, are under contract. Several sections have already been relet, but generally as low as the original contract prices; yet it would obviously be an error to calculate on the completion of the whole work without a liberal allowance for relettings. Even were the prices in all cases high enough to complete the work with judicious management, still the work will *not* all be judiciously managed; and though it may frequently be relet at fair prices, the State will sometimes have, at last, to pay more than its actual value, in order to have it executed in proper time.

During the past year, ditches have been laid out, placed under contract, and partly executed from the Point of Oaks to Chichgo river, and from the mouth of the Saganaskee swamp to Big run; the object of which is to receive and carry off the water which must otherwise drain into the canal, or accumulate behind the spoil-banks. By the aid of these ditches, the water (except what falls within the spoil-banks) may be effectually prevented from conveying deposite into the canal, and also from interrupting the progress of the work during the construction.

At the mouth of the Saganaskee swamp, the canal has been so located as to reclaim a portion of a canal section (section number fifteen,) which will be made very valuable, if the junction of the "lateral canal" with the main line be made at this point. The cost of the canal will not be materially changed by the slight change which has here been made in the location, though the character of the work will be different. The quantity of rock excavation will be much diminished, but a large amount of embankment required.

Two parallel embankments, one upon each side of the canal, must be made the whole length of sections number 42, 43, 44, and part of 45, or more than a mile and a half, and the excavation of the canal made between them. The water between the banks must necessarily be thrown out by machinery, which will have to be kept constantly in operation during the construction. It is important that the contractors should use their exertions to introduce the most economical method of pumping the water from their work, as this at present forms no inconsiderable item of expense. This expense will be comparatively trifling when the proper defences are made, and more perfect machinery used.

Messrs. Greenwood and Bishop (contractors for sections 13, 14, and

15,) have erected a steam-engine for pumping, which is more than adequate to discharge the water from their work under the most unfavorable circumstances; and it is believed that this power will be far the most economical where the quantity of water to be raised is great.

No mechanical work upon the canal has yet been let, except the masonry in the abutments and piers of the Fox river, Pecumsagan, and Vermilion aqueducts, and the dam and guard-lock at the head of the Fox river feeder. It will probably be expedient to let all the structures between Marseilles and the termination early next spring, so that this part of the line which is to be supplied with water from the Fox river feeder may be ready for navigation in the autumn of 1839. This may easily be accomplished if the contractors will use proper exertions; and, if they do not, it may be proper either to relet the work, or finish it by State agents. The completion of this part of the canal will be important not only with regard to navigation, but also on account of the extensive hydraulic power that may be immediately brought into use, and which will add vastly to the value of the State property at Ottawa and La Salle.

A portion of the Middle Division should probably also be let in the spring. The line from Lockport to the foot of the Kankakee bluffs, which will include a great number of structures, and the most of the heavy work that now remains to be let, should be first placed under contract. This part of the line is through a beautiful section of country, which would furnish a large quantity of supplies; and the work is of a kind to invite the attention of the most skilful contractors, and insure its completion at fair prices.

There is now but little doubt that laborers enough can be procured for all the work that is let, and that which it is proposed to place under contract next year. The force upon the canal during the past year, and particularly during the summer and autumn, has been rapidly accumulating; and laborers are still coming in considerable numbers, notwithstanding the lake navigation is closed. The gradual accumulation of the force upon the canal will be shown by the estimates for each quarter of the past year, which are as follows, viz:

1st quarter ending 28th February - - -	$7,902 01
2d quarter ending 31st May - - - -	55,647 62
3d quarter ending 31st August - - -	112,044 02
4th quarter ending 30th November - -	171,305 78
Total - - - - - -	$346,899 43

The entire cost of the Illinois and Michigan canal will probably fall considerably short of my estimate of last year; yet experience has shown that the *actual* cost of any great public work cannot be determined with certainty until its completion. The fluctuation in the price of labor and supplies, and a variety of other causes, render it impossible to estimate the *exact* cost of doing work at any future period; but when many experienced contractors readily contract for work at prices as low or lower than the estimates, it may reasonably be inferred that the estimates are generally *high* enough, and that no attempt has been made to underrate the cost of the canal.

Early in the year, and previous to the revision of the Middle Division, the locating party under the direction of Lieut. Burnett proceeded to make a survey of the lateral canal (agreeably to the law authorizing the same) connecting the Illinois and Michigan canal with the Calumet river, and through this river, with the Michigan and Erie canal of Indiana.

His very satisfactory report, which I take great pleasure in communicating to your Board, will show with what care and ability he has executed this duty, and the praise that he and the young gentlemen who have assisted him so justly deserve.

This canal must be regarded as a valuable auxiliary to the Illinois and Michigan canal, and an important link in the chain of internal navigation in the Western States. By this a direct communication with the head of lake Erie will be obtained by a canal, not exceeding 300 miles in length, (composed of the lateral or "Illinois and Indiana canal," the "Michigan and Erie," and a part of the "Wabash and Erie canals,") which will be particularly useful at such seasons of the year as the lake navigation is uncertain or hazardous. It will connect with a chain of canals in the States of Indiana and Ohio which passes through the valleys of the Wabash, the White river, the Maumee, and the Miami, and connects with the Ohio river at Evansville and Cincinnati. Although this vast chain of canals is not in the general direction of the commerce of this State, yet it is believed that this communication will ultimately give a great accession of business to the Illinois and Michigan canal, by the cheap and safe intercourse established with the various parts of the country thus connected.

The cost of this lateral canal will be trifling, compared with the importance of the object to be obtained by its construction.

The accompanying report, maps, and profiles, of Lieut. Burnett, will convey all the information that your Board may require in relation to the route, cost, and plan, of said canal. The engineers employed by your Board have generally displayed a laudable zeal in the fulfilment of their duties. Mr. Talcott, the resident engineer on the Summit Division, assisted by Messrs. Hanchett and Gooding, and Mr. Jerome, the resident engineer on the Western Division, assisted by Messrs Robinson, O. S. Jerome, and Killaly, have performed their duties in the most prompt and satisfactory manner.

The recent visit of Judge Wright, an engineer whose high reputation for judgment, skill, and experience, has been well earned by a long course of useful service in his profession, has given great satisfaction to the friends of the Illinois and Michigan canal; and it is believed that his approbation of the present plan and location will do much to reconcile conflicting opinions concerning it. During his visit he made an examination of the whole line of canal, and his attention was called to every portion of it where the least difference of opinion could prevail in relation to the location and plan of construction. He took much pains to make himself thoroughly acquainted with every fact necessary to lead to a just conclusion, and though his visit was but short, his opinions were not formed without due deliberation, and may therefore be relied upon with great confidence. All of which is respectfully submitted.

WM. GOODING,

Chief Engineer Illinois and Michigan Canal.

B.

Lockport, *December* 10, 1838.

To William Gooding, Esq.
Chief Engineer.

Sir: In compliance with your request, I herewith present the following report upon the Summit Division of the Illinois and Michigan canal.

For the purpose of rendering the following remarks more perspicuous, I have considered the line in three sub-divisions, agreeable to the general topography of the country and the progress of the work: the first division extending from the south branch of Chicago river to the "Point of Oaks," or Des Plaines river; the second from the "Point of Oaks" to, and including the Saganaskee valley; and the third from said valley to Lockport.

Upon resuming charge of the line in March, 1837, I found nearly every section that had been commenced overflowed by the Des Plaines river, and the work nearly suspended. It was, however, generally resumed in May following.

The first sub-division, extending from section one to fifteen, inclusive, was the second time offered for contract in May, 1837. The unfavorable appearance of the work (nearly one-half of which was overflowed by the river) prevented much competition, and the proposals received were considered much above the real value of the work. Sections one, two, and three, only, were awarded. The commissioners then determined to defend the work by a continuous embankment on the north side, formed by excavation from the prism of the canal, and on the south by a ditch without the spoil-bank, to receive the drainage of the country which is discharged into the southernmost branch of Chicago river. A contract was accordingly made for this purpose; soon after which contracts were made for the construction of the main work, at the engineer's estimate, subject to the contract for the defence. Owing to inefficiency in the contractor, the work of defence was abandoned at an early stage, and subsequently awarded to the contractors for the main work, according to their respective sections.

The season was far advanced before much progress had been made, and the imperfect protection proved no defence against the unusual high water in December, 1837. Nearly every section that had been commenced was overflowed, and the work generally suspended during the winter. It was resumed early in the spring, and throughout the past season has been prosecuted with considerable energy. The plan of defence is now completed, and what has hitherto been considered one of the greatest obstacles to the construction of this part of the line effectually overcome. From the general character of the excavation, (which consists principally of a very compact blue clay, occasionally intermixed with fine gravel,) no great difficulty can be experienced in keeping the work clear of water. It is now in a favorable condition for the coming winter; during which it can be advantageously prosecuted.

At the time of making your first annual report, the work on that part of the line included in the second sub-division (embracing sections 16 to 44, inclusive,) was supposed to consist principally of rock excavation. The circumstances which induced that opinion were the regular rock formation which appears on the west side of the Des Plaines river, opposite the "Point of Oaks," and forms its bed for some distance above and below

this point. It was, therefore, natural to suppose the same geological construction would be found on the east side of the river, and, time not permitting the usual examinations by sinking shafts, it was considered in the estimate as stratified lime-rock. Examinations were made during the summer and autumn of 1837, which show that no regular rock formation exists on this part of the line, until we reach the south side of the Saganaskee valley. The excavation will consist chiefly of clay and gravel, a small portion of detached rock, with an occasional vein of sand—the strata varying frequently in compactness and relative position.

That part of the line opposite to the Saganaskee valley was examined with reference to adopting the present channel, and changing the river to what appears to have been its former channel on the west side of a peninsular island. These examinations were made at a high stage of water, which rendered it difficult to make them with the desirable precision. The data presented, however, were considered sufficient to determine the location by avoiding the river, yet approaching it somewhat nearer than the original line, and improving its general direction. Upon this location and some slight changes in the line above, this division, together with all the sections upon the Summit Division not then under contract, was offered for letting in November, 1837. The principal part of the sections were awarded; but, in consequence of their not being commenced within the prescribed time, several were declared abandoned, and some of them subsequently relet at the engineer's estimate.

The winter of 1837–8 afforded a favorable opportunity for making a more critical estimate of the river opposite to the Saganaskee valley. Its bed in many places was found to be from six to eighteen inches below the bottom of the canal and of the necessary width; but its meanders precluded the possibility of obtaining a symmetrical line which would embrace the full benefit of the channel for any considerable distance. The margin of the channel was particularly examined, and found to consist entirely of a vegetable deposite from twelve to sixteen feet deep, and approaching so near a fluid state that two men could with ease force a sounding rod through it to that depth.

For the purpose of making a just comparison, that part of the line, located in November, which passes across the bayou or expansion of the river and along its margin, was also examined with much care. Upon these examinations the following comparative estimates were prepared:

Line located in Nov., length 127.08 chains, estimate - - - - -	$452,815 00
Line through river, length 126 chains, estimate -	324,204 00
Showing a difference in favor of the river line, of -	$128,611 00

Upon these estimates and an examination of the ground, the commissioners adopted a line passing through the river varying slightly from that upon which the examinations were made. This plan involved a change in the line above this point, much improving its general direction—the line being now direct from the centre of section 36 to the centre of section 45, or 3 miles 54.18 chains, between the points of deflection. The change will somewhat increase the quantity of grubbing and excavation on sec-

tions 38 and 39, and slightly diminish the excavation on sections 40 and 41; but the difference is trifling, compared with the general result.

It may here be proper to remark that the item for forming a new channel for the river, and an embankment to confine and direct its waters, was based upon somewhat hypothetical data. The whole surface being then covered with a heavy mass of ice rendered it impracticable to make a critical estimate. I have recently examined the ground minutely, and prepared an estimate upon the plan of making a channel 200 feet wide, and an embankment raised three feet above the highest water, at the prices for which the work is contracted to be performed.

The length of the line between the extremes of sections 41 and 45 being less than that embraced in the comparative estimates above mentioned, I have revised the estimate accordingly, which will be found in the general tabular statement of the cost of the several sections. In work of this character, it is difficult to anticipate all the contingencies that may occur in the course of construction, and the most careful estimate may be exceeded in the aggregate cost. The quantity of earth and rock excavation, as well as the prices at which they are estimated, is considered liberal; it is, therefore, confidently believed that this part of the line can be constructed at a cost not varying materially from the estimate.

Between the Point of Oaks and the Saganaskee valley, there will be required four receiving reservoirs for the drainage of the country. These will consist of a pit formed in the rear of the spoil-bank, about thirty feet square, excavated to two feet below top-water line of canal, with the sides and bottom paved, and communicating with the canal by a narrow passage. It is believed that these will receive the deposite usually carried into a canal by the drainage-water—forming bars expensive to remove, and frequently proving a serious embarrassment in the navigation.

The cost of these, together with the grading of the towing-path, paved water-ways to receive the falling water into the canal without injury to the banks, and all work not under contract, is included in the aggregate cost of the sections.

The sections not previously under contract throughout the Summit Division were let in June last. Many of them have been commenced, and generally they are believed to be in the hands of efficient men.

The third sub-division, embracing sections 45 to 68, inclusive, comprises the deep rock excavation. Each of these sections have been commenced, and several of them excavated to bottom, from twelve to thirty-five rods in length. During the season of 1837, this part of the work progressed with an increasing vigor until the unusual rise of the river in December, which overflowed several of the jobs and suspended further operations until the ensuing spring. Under these circumstances, it became apparent that it would be imprudent to rely upon the protection which the contractors might think proper to make, though bound, in self-defence, to make it efficient. It was therefore deemed advisable by the commissioners to construct a permanent and continuous defence against the waters of the river and the drainage of the country, at the expense of the State. This may now be considered as complete from section 49 to 60, inclusive—the work below 60 not being subject to overflow from the river. The protection on sections 47 and 48 is not far advanced; but, from their relative position, no danger can accrue to the work below. There can no longer

be any apprehension of delay or interruption to the uniform progress of the work from this cause. The falling water, and what filters through the fissures of the rock, is readily discharged by the ordinary pump worked by horse-power. As the work progresses, however, and a larger surface is to be drained, a resort to steam-power will probably be found the best economy, though not indispensably necessary. Several contractors are making arrangements to procure steam-engines during the winter.

The sickness of the past season has materially checked the progress of the work; and though the general health of the country is restored, the work has not yet assumed its former vigor.

About 150 men have recently been brought from Canada, and two of the contractors are now absent for the purpose of procuring others. Agents are employed for this object; and from the efforts now making, a considerable reinforcement may be expected in the course of the winter. An accession of at least 3,000 men should be made to this division early next spring.

The following amount of the estimates for each quarter of the years 1837–8, will show the comparative progress of the work.

1837.		
First quarter ending February 28 - -	$3,360 00	
Second quarter ending May 31 - -	35,693 57	
Third quarter ending August 31 - -	46,420 94	
Fourth quarter ending November 30 -	95,062 46	
		$170,536 97
1838.		
First quarter ending February 28 - -	58,095 52	
Second quarter ending May 31 - -	96,651 81	
Third quarter ending August 31 - -	231,567 13	
Fourth quarter ending November 30 -	142,187 58	
		528,502 04

When the amount of work performed during the two past years is contrasted with the expectations then formed by many of its friends, some may feel disappointed; yet when it is considered that the season of 1837 was unusually wet; that nearly every section that had been commenced was overflowed by the river, and the work necessarily suspended until the ensuing spring; the sickness that has prevailed through the past season; that the work is now generally secure against the surface water; and that cranes and railroads are now successfully employed for removing the rock on nearly every section—it must be admitted that much has been done under the circumstances, and that the work presents a truly flattering prospect for its rapid progress in future.

Tabular Statement showing "the work done, and the prices allowed for Michigan Canal, to November 30, 1838; also, the estimated value of

Contractors' Names.	No. of Section.	Length in chains.	Cubic yards earth excavation.	Price per yard.	Cubic yards of rock excavation.	Price per yard.	Cubic yards of ditch excavation.	Price per yard.	Cubic yards of embankment.
				cts.		*cts.*		*cents.*	
South branch of Chicago river	-	396	-	-	-	-	-	-	-
Madore B. Beaubien	1	57	71,016	20	-	-	-	-	-
Mallory & Hurlbut	2	60	24,420	22	-	-	-	-	-
Osborne & Stewart	3	40	32,257	24½	-	-	-	-	-
Same	4	40	10,665	27½	-	-	-	-	-
Ogden & Dole	5	40	25,388	25	-	-	-	-	-
Same	6	40	45,243	26	-	-	-	-	-
Harmon, Loomis & Raymond	7	40	25,050	25	-	-	-	-	-
Same	8	40	42,806	26	-	-	-	-	-
Same	9	40	27,090	25	-	-	-	-	-
Temple & Carver	10	40	30,710	26	-	-	-	-	-
Same	11	40	28,145	25	-	-	-	-	-
Same	12	42	17,780	25	-	-	-	-	-
Greenwood & Bishop	13	40	33,727	25	-	-	-	-	-
Same	14	40	38,272	25½	-	-	-	-	-
Same	15	41	65,270	30	-	-	-	-	-
Greenwood, Osborne & Strail	16	34	31,240	24	-	-	-	-	-
Same	17	30	27,230	23	-	-	-	-	-
Hubbard & Boone	18	30	-	-	-	-	-	-	-
Same	19	30	24,580	25	60	100	-	-	-
Same	20	30	9,450	25	-	-	-	-	-
Wilder, Rutter & Bursbee	21	30	19,220	25	28	100	-	-	-
Same	22	29	-	-	-	-	-	-	-
Taylor, Breese & Co.	23	30	27,960	26	-	-	-	-	-
Same	24	30	17,440	26	60	100	-	-	-
Boyd, Zell & Co.	25	30	26,780	25	130	100	-	-	-
Same	26	30	1,600	26	-	-	-	-	-
Edward Cody	27	30	7,890	23	-	-	-	-	-
	28	30	-	-	-	-	-	-	-
Cochran & Armstrong	29	29	1,360	22	-	-	-	-	-
Harney & Flockhart	30	30	6,260	27	16	100	-	-	-
E. W. Minor	31	31	9,610	26	-	-	-	-	-
	32	30	-	-	-	-	-	-	-
Yarwood & Richardson	33	30	280	29	-	-	-	-	-
Robert Jobson	34	30	-	-	-	-	-	-	-
Beach, Rood & Myers	35	30	-	-	-	-	-	-	-
Irwin, Kittering & Co.	36	30	-	-	-	-	-	-	-
Beach, Rood & Myers	37	30	6,280	30	-	-	2,000	30	730
Same	38	33	-	-	-	-	-	-	-
Irwin, Kittering & Co.	39	30	5,270	32	-	-	-	-	-
Same	40	30	2,640	32	-	-	2,300	35	-
	41	24	6,370	30	-	-	780	25	-
	42								
Kennedy & Bracken*	43	118	-	-	-	-	-	-	-
	44								
Alton & Pestana	45	30	5,398	20	9,972	123	-	-	-
Smith, Granger & Co.	46	30	5,498	26	10,495	127	-	-	-
William Avery	47	30	6,180	28	-	-	-	-	-
Same	48	30	4,968	28	15,351	128	-	-	-

* Through river. For embankment and forming a new channel for the river.

the various kinds of work," on the Summit Division of the Illinois and work not under contract, and the cost of each section, at contract prices.

Price per yard.	Cubic yards of lining.	Price per yard.	Cubic yards puddling.	Price per yard.	Grubbing and clearing.	Cubic yards of wall.	Price per yard.	Amount of work done.	Amount of work not under contract.	Cost of section at contract prices.	Remarks.
cts		cts		cts			cts				
					3,515 75			$3,515 75	$12,898 39	$16,414 14	Tow path bridge
								14,289 47	1,500 00	27,277 66	
								5,372 40	1,500 00	37,310 60	
								7,924 50	1,000 00	36,067 90	
								2,939 70	1,000 00	37,339 00	
								6,347 00	1,000 00	43,231 84	
								12,048 47	1,000 00	45,741 45	
								6,262 50	1,000 00	43,474 46	
								11,232 82	1,000 00	52,400 75	
								6,772 50	1,000 00	51,530 90	
								7,991 50	1,000 00	49,251 75	
								7,036 25	1,000 00	46,041 50	
								4,445 00	1,500 00	40,680 05	
								8,431 75	1,000 00	41,242 35	
								9,778 00	1,500 00	38,734 00	
								20,099 50	1,000 00	44,488 75	
								7,540 80	5,078 67	38,713 87	Road bridge.
								6,262 90	750 00	29,419 30	
								-	750 00	32,706 85	
								6,372 00	900 00	36,916 85	
								2,362 50	900 00	35,438 10	
								4,833 00	900 00	41,122 85	
								-	900 00	45,017 30	
					† 535 98			8,045 58	800 00	34,040 30	
								4,630 00	2,150 00	32,491 26	Reservoir.
								7,005 00	1,200 00	40,002 00	
								416 00	750 00	33,399 50	
								1,814 70	2,450 00	32,221 00	Reservoir.
								-	36,244 40	36,244 40	
								298 32	900 00	26,349 16	
								1,689 60	2,150 00	35,120 44	Reservoir.
								2,498 60	900 00	35,119 28	
					975 00			975 00	40,636 80	41,611 80	
					1,350 00			1,431 20	900 00	39,866 92	
					2,200 00			1,200 00	800 00	42,075 40	
					600 00			600 00	2,150 00	37,375 20	Reservoir.
					-			-	750 00	36,608 00	
25			500	15	550 00			3,291 50	1,000 00	43,527 00	
					250 00			250 00	1,200 00	62,015 00	
					1,400 00			3,086 40	1,000 00	50,294 40	
			400	15	350 00			2,059 80	800 00	38,779 86	
								2,106 00	700 00	32,779 25	
											Bridge over river and canal.
								-	234,191 17	320,443 67	
								13,287 84	600 00	120,451 24	
								14,765 57	600 00	113,969 60	
								1,730 00	600 00	108,554 03	
								21,040 64	600 00	103,487 66	

† Road bridge across slough.

Contractors' names.	No. of section.	Length in chains.	Cubic yards earth excavation.	Price per yard.	Cubic yards rock excavation.	Price per yard.	Cubic yards ditch excavation.	Price per yard.	Cubic yards embankment.
				cts.		*cts.*		*cents*	
J. & S. Clifford	49	30	5,695	27½	5,757	137	180	20	–
John Rogers	50	30	17,680	26	23,379	141	564	22	–
Hugunin & Brown	51	30	13,818	35	34,442	155	1,114	55	–
Same	52	30	14,560	30	4,534	152	788	60	–
Roberts & Roberts	53	30	4,233	28	19,790	120	370	29	–
James Brooks	54	30	4,292	35	14,870	157	137	40	–
Same	55	30	4,449	36	3,240	151	–	–	–
Stewarts, Sanger & Wallace	56	30	3,975	23	18,100	169	212	16	–
Same	57	30	3,890	24	19,500	170	157	16	–
Pruyne, Negus & Rogers	58	33	3,010	33	28,880	143	–	–	–
Same	59	27	3,810	31	2,652	135	–	–	–
Hardy & Williams	60	30	3,977	25	26,870	125	–	–	–
Stevens, Douglass & Norton	61	30	7,955	18	23,240	114	–	–	–
John Lonirgan	62	30	4,021	34	9,580	105	–	–	–
Same	63	30	4,500	37	10,625	110	–	–	–
John V. Singer	64	36	5,477	16	30,996	103	401	14	–
Pettibone & Root	65	39	7,563	21	2,806	100	237	15	–
Same	66	60	13,197	21	4,130	97	1,442	20	11,220
Wm. B. & E. Newton	67	45	17,350	16	5,150	80	3,239 E 414 R	21 125	3,964
Same	68	63	5,580	18	8,800	80	–	–	–
South branch & Summit ditch	–	–	28,593	21½	–	–	–	–	–
Sag and Big run ditch	–	–	20,020	20	20,873	67	–	–	2,984
Protection on rock work	–	–	–	–	–	–	–	–	–
Basin at forks of Chicago river	–	–	–	–	–	–	–	–	–

Amount of work performed - - - - -
Amount of work not under contract - - -
Length thirty-four miles thirty-one chains. Aggregate cost - -

NOTE.—Fractions omitted in print.

MENT—Continued.

Price per yard.	Cubic yards lining.	Price per yard.	Cubic yarps puddling.	Price per yard.	Grubbing and clearing.	Cubic yards wall.	Price per yard.	Amount of work done.	Amount of work not under contract.	Cost of section, at contract prices.	Remarks.
cts		*cts*		*cts*			*cts*				
-	-	-	-	-	-	-	-	$9,502 17	$600 00	$111,730 52	
-	-	-	-	-	190 00	-	-	37,990 79	1,100 00	113,311 23	
-	-	-	-	-	200 00	-	-	59,636 20	1,200 00	117,458 76	
-	-	-	-	-	-	-	-	11,769 70	1,100 00	102,171 32	
-	-	-	-	-	-	-	-	25,036 54	500 00	83,241 06	
-	-	-	-	-	-	-	-	24,985 15	500 00	91,303 07	
-	-	-	-	-	-	-	-	6,570 33	800 00	83,673 05	
-	-	-	-	-	-	-	-	31,561 05	600 00	94,383 29	
-	-	-	-	-	-	-	-	34,282 90	600 00	91,654 12	
-	-	-	-	-	-	-	-	42,458 38	600 00	93,039 93	
-	-	-	-	-	-	-	-	4,775 83	800 00	67,751 72	
-	-	-	-	-	-	-	-	34,646 25	600 00	75,809 28	
-	-	-	-	-	-	-	-	28,096 70	600 00	71,481 34	
-	-	-	-	-	-	-	-	11,536 42	700 00	64,190 59	
-	-	-	-	-	-	-	-	13,393 75	700 00	69,003 16	
-	-	-	-	-	-	-	-	33,183 83	1,267 69	68,209 59	Stop gate.
-	-	-	-	-	-	-	-	4,439 55	-	36,058 50	
30	-	-	-	-	45 00	2,080	50	11,567 75	4,821 20	42,583 40	Water way 500 feet long.
28	400	45	400	15	-	1,700	50	9,923 45	1,717 00	25,027 00	Wood culvert.
-	930	40	930	15	-	1,440	31	9,002 30	83,968 15	125,132 63	Hydraulic basin and bridge.
-	-	-	-	-	-	-	-	6,135 67	-	6,135 67	
19	-	-	-	-	72 00	458	40	19,024 15	-	19,024 15	
-	-	-	14,532	90	-	22,556	45	23,853 70	-	28,429 00	
-	-	-	-	-	-	-	-	-	43,500 00	43,500 00	
		-		-		-		747,813 02			
		-		-		-		-	520,423 47		
		-		-		-		-	-	4,131,690 97	

In presenting the above estimates, I would observe that throughout the earth excavation, where the work has been laid out, the quantity is correctly calculated, and, if completed at present contract prices, shows the cost of the work. Wherever the work has not been laid out, the estimate of quantities has been made liberal, being desirous rather to exceed than underrate the cost. From section 16 to 44, inclusive, from one to two thousand cubic yards of detached rock per section has been estimated. The variation of this item will slightly vary the cost of the section.

Observation and developments of the general character of the work during its progress, thus far, confirm the opinion that the contract prices are adequate to the construction of the work.

On the rock cutting, it will be observed that in some cases considerable discrepancy exists between the present and the original estimates. This arises in some cases from a misconception of the relative quantity of earth and rock at the time of making the first estimate. This cannot be correctly ascertained until the superincumbent earth is removed and the surface of the rock fairly exposed. On many of the sections this has been done, and the quantities carefully estimated; on others, such data has been obtained, by a partial removal of the earth, as to render the present estimates a very close approximation to the true amount. Some of the sections have been let at prices higher than the first estimate, and some relinquished and subsequently let above the first prices. The most striking difference exists in sections 66, 67 and 68. This is in consequence of a change from the original plan of construction. It was at first designed to form only a single bank for the towing-path, and suffer the water to expand over the low ground on the opposite side, which at present is rendered a marsh by the overflow of Big run. By the present plan, the canal is to be confined within regular banks faced with rock taken from the excavation; and the waters of Big run confined by a guard-bank extending from the bluffs to the head of section 66, where, in connection with the surplus water of the canal, and the accumulated drainage of the country from section 46 to this point, it is received into the canal and discharged directly opposite by a sluice or water-way 500 feet in length.

This arrangement adds much to the permanence and symmetry of the canal, and reclaims about 300 acres of valuable land, 200 of which belong to the State.

The structures embraced in the estimate consist of a towing-path bridge over the south branch of the Chicago river—three road bridges over the canal—a bridge over the Des Plaines river at the Sag—a stop gate on section 74—a water-way and tow-path bridge on section 66—a wooden culvert on section 67, and the hydraulic basin on section 68.

Believing that it will frequently be found advantageous to the commerce of the country, for the lake vessels to navigate the canal as far as Lockport, turning or pivot bridges have been estimated.

The formation of a basin at the forks of the Chicago river being considered as part of the general plan of the canal, is also embraced in the present estimate.

Respectfully submitted by
Your obedient servant,
EDWARD B. TALCOTT,
Resident Engineer.

C.

To William Gooding, Esq.,

Engineer in Chief on the Illinois and Michigan canal.

Sir: In pursuance of your directions, I proceeded with my party, early last spring, to revise, locate, and prepare for letting, that portion of the Middle Division of the Illinois and Michigan canal embraced between Lockport and Dresden, a distance of twenty-one miles—sub-divided into forty sections, of forty-two chains each. From Lockport to Juliet, a distance of three miles and sixty-six chains, the line is entirely changed from the original survey. At the beginning of this division, is located lock number 1, of ten feet lift, with a guard of two and a half feet, to meet the contingency arising from the fluctuation of lake Michigan. One mile below, is located lock number 2, of ten feet lift; and about one mile and a half above Juliet, locks number 3 and 4, of ten feet lift each. For three-fourths of a mile above, and nearly through Juliet, the canal occupies the bed of the Des Plaines river, and is of increased width. The banks for this distance are to be raised some feet above the ordinary height, and to be protected from the wash of the floods by substantial walls on the inner sides.

The river is to be raised to the requisite height by two stone dams at Juliet. With the upper dam is connected lock number 5, of ten feet lift, with a guard of four feet, making a valuable water-power on canal land. With the lower dam is connected a guard-lock; at which point the canal leaves the river.

Owing to the great height of the spring floods, it became apparent that the line from Juliet to and over the Du Page river would be benefitted by being located on a higher level than the former, of some five or six feet. This location varies the line some considerably from the original, although, taking the whole distance, the cost of construction is not materially changed; and it is believed that a better location has been obtained. By this means the Du Page river is passed by an aqueduct sufficiently elevated above the highest floods to secure its permanency.

About three miles above the aqueduct, the Du Page is to be received into the canal by a side cut of twenty chains in length, connected with a dam across said river. There is to be a guard-bank extending from the dam up the east side of the river twenty-six chains. This bank is deemed necessary to prevent serious injury, which would otherwise accrue to the canal at this point, from the high floods. Immediately below the aqueduct, are located locks number 6 and 7, with an aggregate lift of fifteen and a half feet. From thence to Dresden, a distance of five miles, the line occupies nearly the ground of the original location. The greater portion of this distance, the canal passes at the foot of the Kankakee bluffs; some part of the way in the edge of the Des Plaines and Illinois rivers—the towing-path bank to be protected from the great floods and extensive ice jams formed by the uniting of the waters of the Des Plaines and Kankakee rivers, by a strong wall on the river side.

Especial reference was had, in locating the above twenty-one miles of canal, in such manner as would best afford those wishing to make an examination of the work, every facility to do so with accuracy; the nature of the excavation being expressed by shafts sunk at suitable distances—a large stake properly registered planted at the beginning of each section,

with intermediate stakes once in sixty-six feet, with the coresponding levels recorded on the same.

The plans, maps, and profiles, together with an estimate of the cost of the above work, were prepared and submitted prior to the letting on the fifth of June last; at which time this portion of the canal was put under contract. The work generally was commenced as per requirement, and prosecuted the brief time intervening between that period and the beginning of the excessive sickness which prevailed through this section of the country, during several months of the past season—with very considerable vigor, giving flattering hopes that this portion of the work would be completed in the time specified.

From the first of August to about the first of November, the severity of the sickness caused an almost entire cessation of the progress of the work, notwithstanding most of the contractors were endeavoring to advance it as fast as circumstances would admit. In a few instances contracts have been abandoned and relet; but at present there seems to be generally, among the contractors, a disposition manifested to make all suitable progress with the work. Some sections are already nearly completed, as a reference to the tabular statement will show. The number of men employed upon this division of the canal, on the first of September last, was 145, and the work done was $48,468 42. The number of men employed on the 30th November, is 607, and the amount of work done, is $37,857 25; making the total amount of work now done on this division, to be $86,325 67.

The remainder of this Division, a distance of about seventeen miles, has not been resurveyed; but a tabular statement of your former report, showing the cost of construction of that portion of the canal, is annexed.

The annexed tabular statement is designed more fully to show the amount of the different denominations of work done, the amount of work to be done, and the total amount when done.

Tabular Statement showing the work done, and the prices allowed for the gan Canal, from section number 69 to section 108, inclusive, to the work not under contract on each section; and the total amount when

Names of Contractors.	Number of section.	Cubic yards of earth excavation.	Price per yard.	Cubic yards of rock excavation.	Price per yard.	Cubic yards of earth embankment.	Price per yard.	Cubic yards of rock embankment.
			cents.		*cents.*		*cts*	
George Barnett - - -	69	3,333.45	18	3,048.75	95	213.41	30	-
Same - - -	70	22,697.40	35	1,299.34	90	6,932.90	30	-
Same - - -	71	10,592.13	25, 16	5,379.92	74, 98	1,376.24	30	-
Same - - -	72	15,766.04	27	883,08	90	3,530.82	40	-
Charles Kerr - - -	73	2,567.66	23	274.56	60	127.64	50	-
Sterling & Blanchard - -	74	943.36	18	1,532.76	80	-	-	-
Same - - -	75	-	-	-	-	-	-	-
James Ryon & Co. - -	76	2,996.99	37	5,313.51	110.4	126.60	40	-
Steel & Amer - - -	77	73.26	15	792.04	68	-	-	766.96
Mattison & Ryon - -	78	85.58	20	640.65	75	-	-	-
N. & S. S. Davis - -	79	836.38	20	2,623,64	70	1,639.15	40	3,458.77
Samuel R. Bradley - -	80	1,860.32	20	-	-	6,638.48	20	-
Hugh McLaughlan - -	81	1,444.76	22	-	-	660.44	28	-
Jeremiah Crotty - - -	82	7,688.68	22	-	-	-	-	-
Same - - -	83	4,126.74	27	-	-	-	-	-
A. P. McDonald - - -	84	1,431.92	20	-	-	87.22	27	-
Hendrix & Rush - - -	85	-	-	-	-	-	-	-
Same - - -	86	264.00	20	-	-	3,653.30	20	-
Same - - -	87	1,059.30	25	985.70	50	3,709.77	22	-
Richard Morris - - -	88	435.02	15	676.96	72	-	-	-
Gay, Manning & Co. - -	89	2,566.21	23	-	-	2,521.38	25	-
Same - - -	90	12,735.00	25	-	-	1,025.00	25	-
Lot Whitcomb - - -	91	3,901.50	15	-	-	-	-	-
William A. Chatfield - -	92	7,341.00	20	-	-	270.60	25	-
L. Whitcomb (Du Page feeder)	-	3,357.17	25	-	-	8,224.41	25	-
Benjamin M. Webber - -	93	2,702.00	18	-	-	534.90	20	-
John Hassock - - -	94	261.36	15	-	-	-	-	-
Same - - -	95	10,386.20	15	-	-	5,936.56	18	-
Hendrix & Rush - - -	66	8,599.20	26	-	-	2,519.00	30	-
Same - - -	97	816.17	26	-	-	-	-	-
Sherburn and Gobin - -	98	670.00	23	-	-	2,532.31	23	-
Obed Smith - - -	99	2,958.40	20	-	-	242.20	25	-
Sherburn & Gobin - -	100	-	-	-	-	-	-	-
Caldwell & Milligan - -	101	781.02	20	-	-	600.80	25	-
James Drummond - -	102	123.30	18	-	-	-	-	-
H. D. Risley - - -	103	1,557.60	18	-	-	-	-	-
Clifford & Stewart - -	104	414.92	24	-	-	-	-	-
Crawford, Harvey & Harvey	105	-	-	-	-	-	-	-
Same - - -	106	-	-	-	-	-	-	-
Same - - -	107	-	-	-	-	-	-	-
Same - - -	108	4,510.13	17	-	-	3,702.80	23	-

a Lock number 1, twelve and a half feet lift.
b Lock number 2, 10 feet lift.
c Lock number 3, ten feet lift.
d Towing-path bridge over the Des Plaines.
e Lock number 5, ten feet lift, with a guard and dam across the Des Plaines.
f Guard-lock number 1, and dam number 2; towing-path bridge over canal.
g Road bridge over canal.

various kinds of work on the Middle Division of the Illinois and Michi-
30th November, 1838; *the amount of work to be done; the amount of completed.*

Price per yard.	Cubic yards of slope wall.	Price per yard.	Grubbing & clearing.	Cubic y'ds of masonry.	Price per yard.	Aggregate now done.	Aggregate to be done; under contract	Aggregate of items not under contract.	Total when done.
cts		*cents.*			*cents.*				
-	-	-	-	-	-	$3,560 35	$47,335 99	$6,806 25	*a* $57,702 59
-	4,056.18	118.4	475 00	-	-	16,470 86	2,134 00	4,226 75	22,831 61
-	-	-	-	493.39	226.65	8,230 35	37,154 17	2,771 00	*b* 48,155 52
-	1,914.79	109.04	-	-	-	8,551 77	6,997 58	-	15,549 35
-	72.82	47	360 00	-	-	1,214 34	91,025 51	3,900 00	*c* 96,139 85
-	81.40	75	400 00	-	-	1,857 06	29,757 04	800 00	*d* 32,214 10
-	-	-	-	-	-	-	39,977 85	-	39,977 85
-	301.66	75	7 00	625.15	420.6	9,898 46	82,419 40	1,950 00	*e* 94,267 86
42	-	-	-	-	-	871 70	46,928 85	2,950 00	*f* 50,750 55
-	-	-	-	-	-	497 61	24,936 44	-	25,434 05
32	802.50	75	8 00	-	-	4,376 24	17,331 76	-	21,708 00
-	-	-	-	-	-	1,706 34	4,120 86	1,670 00	*g* 7,497 20
-	-	-	-	-	-	502 77	13,113 09	-	13,615 86
-	-	-	-	-	-	1,691 51	10,031 86	-	11,723 37
-	-	-	-	-	-	1,114 22	8,567 48	-	9,681 70
-	-	-	-	-	-	309 93	5,737 07	-	6,047 00
-	-	-	-	-	-	-	7,301 60	1,125 00	*h* 8,426 60
-	-	-	-	-	-	783 46	5,364 24	-	6,147 70
-	-	-	25 00	-	-	1,598 81	7,379 79	-	8,978 60
-	-	-	200 00	-	-	752 66	5,192 95	3,194 20	*i* 9,139 81
-	-	-	10 00	-	-	1,230 57	9,005 91	-	10,236 48
-	-	-	-	-	-	3,440 00	2,061 00	-	5,501 00
-	-	-	-	-	-	585 22	2,875 20	-	3,460 42
-	-	-	100 00	-	-	1,635 85	5,169 95	900 00	*k* 7,705 80
-	-	-	-	-	-	3,045 39	1,202 88	2,500 00	*l* 6,748 27
-	-	-	10 00	-	-	603 34	8,982 24	-	9,585 58
-	-	-	30 00	-	-	69 20	1,472 47	-	1,541 67
-	-	-	130 00	-	-	2,756 51	923 48	-	3,679 99
-	-	-	100 00	-	-	3,091 49	8,170 15	-	11,261 64
-	-	-	-	-	-	212 20	12,009 95	2,500 00	*m* 14,722 15
-	-	-	-	50.75	4.14	958 03	82,241 07	5,400 00	*n* 88,599 10
-	-	-	-	-	-	652 23	11,859 92	-	12,512 15
-	-	-	-	-	-	-	4,157 00	-	4,157 00
-	-	-	60 00	-	-	366 40	5,588 65	-	5,955 05
-	-	-	400 00	-	-	422 19	37,520 17	-	*o* 37,942 36
-	-	-	300 00	-	-	580 36	37,707 60	3,375 00	*p* 41,662 96
-	-	-	220 00	-	-	319 58	8,366 77	900 00	9,586 35
-	-	-	-	-	-	-	21,063 12	-	21,063 12
-	-	-	-	-	-	-	70,745 49	966 00	*q* 71,711 49
-	-	-	400 00	-	-	400 00	112,400 67	-	112,800 67
-	-	-	350 00	-	-	1,960 36	21,287 18	1,844 16	*r* 25,099 70
						$86,325 36	957,618 40	47,778 36	1,091,722 12

h Wood culvert equal to ten feet chord. *i* Dam across Rock run with lateral banks; towing-path bridge. *k* Wood culvert equal to eight feet chord. *l* Dam for feeder across Du Page and guard-gates. *m* Road bridge over the canal. *n* Aqueduct over Du Page river; locks number 6 and 7. *o* Wood culverts—one of ten feet, one of eight feet chord, and waste-weir. *p* Wood culvert equal to eight feet chord. *q* Wood culvert equal to eight feet chord. *r* Stone culvert equal to eight feet chord

A tabular statement of the remainder of the Middle Division.

No. of section.		
109	$5,933 04	Plain.
110	8,731 78	Paved water-way.
111	17,606 00	Plain.
112	20,211 00	Aqueduct over Aux Sable river—Road bridge.
113	10,535 25	Plain.
114	5,762 98	Plain.
115	7,557 00	Plain.
116	34,301 12	Lock No. 8—8 feet lift.
117	5,318 49	Plain.
118	5,171 45	Plain.
119	6,215 94	Plain.
120	4,957 24	Plain.
121	6,902 91	Wood culvert, 6 feet chord.
122	4,365 00	Plain.
123	6,448 40	Waste-weir.
124	32,671 56	Stone culvert, 24 feet chord, over E. branch of Nettle creek.
125	22,655 32	Stone culvert, 30 feet chord, over W. branch of Nettle creek.
126	4,880 40	Plain.
127	4,495 40	Plain.
128	4,133 40	Paved water-way.
129	9,357 86	Stone culvert, 6 feet chord.
130	10,385 70	Wood culvert, 4 feet chord.
131	8,212 04	Plain.
132	4,748 04	Plain.
133	5,309 06	Wood culvert, 12 feet chord.
134	18,165 75	Plain.
135	10,300 40	Towing-path bridge.
136	5,549 96	Paved water-way.
137	7,096 80	Plain.
138	5,280 86	Plain.
	303,262 15	
	1,091,722 12	Amount brought forward.
	$1,394,984 27	

All which is respectfully submitted.

With great respect, your obedient servant,

WILLIAM JEROME, *Resident Engineer.*

D.

Ottawa, La Salle Co., Ill.
December 1, 1838.

To William Gooding Esq.,
Chief Engineer Illinois and Michigan Canal.

Sir: In compliance with your request, I have the honor to present to you the following report upon the progress of the construction of the Western Division of the Illinois and Michigan canal, with such other information as you have desired.

I was directed to take the charge of the division, as resident engineer, early in March, 1838. It was then generally located, and all the work now under contract, excepting some of the structures, section 167, and the side cut or "lateral canal" at Ottawa, had been let, and was in progress of construction.

The Western Division had been divided into three sub-divisions, each under the superintendence of an assistant engineer, which, on account of the peculiar character of the work developed, and for convenience, will be seperately considered.

The first sub-division was made to commence at section 141, or the eastern extremity of the Division, and to extend to the Fox river aqueduct and section 167, at the crossing of Fox river, inclusive. The second, from section 168 to 179, one-half mile below the western extremity of Buffalo rock. The Fox river feeder, intended to supply this division with water from the foot of the locks at or near Marseilles to the termination of the canal on the Illinois river, has been annexed to this sub-division, as also the "lateral canal" at Ottawa; and the third sub-division embraces all that portion of the canal from section 180 to its termination, about three-fourths of a mile below the town site of La Salle. The length of the main canal embraced in this division, 29.32 miles—of the Fox river feeder, 4.93, exclusive of the "lateral canal" at Ottawa, proposed to open a communication with the Illinois river at this place—presenting almost all the varieties of work that can occur in canal constructions.

Having received no directions to locate definitively that portion of the sub-division which lies above Marseilles and includes the two lift locks at that place, which location would not probably have materially altered the original estimates, that portion of this division is carried into the present estimate at the amount contained in your report of 1836. The topography of the ground between Marseilles and Ottawa over which the canal passes is level, with slight undulations, and was generally placed under contract in the month of June, 1837. It was then supposed to consist principally of common earth excavation, and contracted for at correspondent prices. Since then, as the work has progressed, other materials have been met with, presenting the varieties of cemented clay, soft slate, and slate rock, and other silicious and argillaceous compounds in all the stages of formation from earth to rock. These items have been classified, and your estimate affixed to them, as material for which the contractors had no contract price; and it is believed that, unless the character of the work should further change from what has been discovered, which is not probable in its present advanced stage, they will prove suffi-

cient for its completion. This variety of material is found generally to exist in strata at various distances from the surface of the earth commencing with the softer materials first, until, on some of the sections, a firm slate or sound rock is met with.

The increased expense on account of these materials will be found to exist principally upon sections 155, 159, 160, 161, 162, 163, 164, and 165 This portion of the Western Division has not progressed as rapidly as others, owing principally to the irresponsibility of many of the original contractors, who have since left or entirely neglected their work, enabling the Board of Commissioners to place the work in better hands. There is an important increase in the expense of section 167, which includes the Fox river aqueduct, owing principally to the necessity of advanced prices upon the masonry of that structure. It was first let in November, 1837, and relet in June last at such prices and to such men as it is believed are fully competent to the completion of the masonry of this important structure. A wooden superstructure is embraced in the plan, estimates of which are given. A model of the plan will be presented for the consideration of the commissioners at an early day. Upon this sub-division there has been one section completed. The stone culverts upon sections 156 and 158 have been let, and were commenced under favorable auspices. Quarries of a species of sand stone were opened that have thus far stood the test of very severe weather; and some of this stone, with other materials, has been delivered.

The second sub-division, extending from Ottawa, passes over the high bottom of the Illinois valley until it reaches the western extremity of section 173, whence it follows the general outline of the base of Rocky bluffs to section 176, inclusive, where it enters a depression that it follows to section 179, which consists principally of high embankment at the crossing of the outlet of said depression, and is the termination of this sub-division.

The estimates of this sub-division will be found to approach very near to yours of 1836, the principal difference exhibiting itself in those of sections 172 and 175, where, in consequence of the convenient distance of the quarry from which stone is obtained for the Fox river aqueduct, the locks embodied with them have been let at lower prices than the original estimates. This and other items diminish the estimated expense of these sections, as may be seen by reference to the accompanying estimate made from contract prices.

The Fox river feeder, with its dam and guard-lock, is advancing rapidly to completion. The line of the feeder upon which former estimates were predicated crossed a ridge of land that connected a promontory or mound upon the bank of the Fox river with the main bluffs of the Fox and the Illinois valleys. The adoption of this line would have occasioned the necessity of very deep cutting through the ridge into a difficult material; and the former resident was directed by you to make examinations around the mound, following the bank of the Fox river; which examinations resulted in the definitive location of that line. This change has materially lessened the former estimates of the feeder at the contract prices. More rock and cemented clay have been found upon some of the sections than was anticipated: which, together with the increased length of the feeder, occasioned by a curve to form the junction with the main canal upon State

land to enhance its value, have contributed to lessen the amount of the favorable difference existing between former estimates and those of the work as now located. One section has been completed. The Fox river dam is completed, except the gravel filling required above it, which will be deposited in the course of the next month. The abutment and guard-lock were not carried much above the present surface of the water. The severe sickness that we have experienced during the last season delayed operations until it was too late in the season to lay hydraulic masonry. It will be secured from injury during the winter, as far as possible, by covering it with the heavy stone prepared for its completion. The "lateral canal" has been commenced and a sufficient quantity of the rock uncovered, by the earth excavation, to enable us to estimate its probable expense with approximate accuracy. The plan of the basin to be attached to it, not having been fully determined on by the commissioners, nor the mode of applying the water-power to be obtained through the Fox river feeder, its estimate cannot be relied on as very accurate. The whole estimates of this work are embraced with those of the division, and it is connected with it by the direction of the commissioners.

The third sub-divison, extending from section 180 to the Illinois river, embraces a great variety of work. It is carried from section 167, upon the high bottom of the Illinois valley near the bluffs, to section 188, whence it follows the outline of the base of the bluffs crossing the Pecumsagan, piercing Camp rock, a remarkable projection from the main bluff; thence to the crossing of the Little Vermilion, then through La Salle, when it leaves the bluff and enters upon the river bottom, where the former canal commissioners directed the construction of an extensive basin for the purpose of the canal and river navigation. This basin is made to communicate with the river, through the same bottom land, by a steamboat channel. The change in the character of the work as it has progressed upon this sub-division; the injuries that it received during the extraordinary freshets of last spring; and the necessity of guarding against such an occurrence in future, by the construction of extensive protection walls, will account for the increase upon these sections of the Western Division. For example, upon sections 183, 184, 185, 186, and 187, rock was met with to a much greater extent than was anticipated. Upon sections 188 and 189, there was a large item allowed for sinkage of bank into the marsh, and an expensive alteration required for symmetry of line upon section 190, mainly owing to the increased expense of the Pecumsagan channel. The wash of the spring freshet occasioned a deposite in the channel as excavated last year of near 8,000 cubic yards, and produced the necessity of constructing a permanent stone dam at the upper end of this artificial channel, to prevent such accidents in future. This dam is now nearly completed, and when the slope wall connected with it shall have been made, it is believed the work will be secure. Upon section 190, the increase is somewhat owing to the sinkage of the heavy embankment west of Camp Rock, and the necessity of protection for said embankment. The expense that sections 192, 193, and 194, will incur, cannot be closely estimated at present, as it is believed that the bank or bluff will continue to slide into the prism; which slide must be removed to retain the proper width of canal. Upon sections 196 and 197, a material increase is exhibited, owing to a modification of the original plan made with the view

to accommodate it to the plan of the town site of La Salle, and to give increased basin room by an increased width of a portion of the steamboat channel. This work has not progressed as was desired by the commissioners, and indeed is far behind the other sections of this division, when its expensive character is considered. Three sections have been completed upon this sub-division.

The number of men employed upon this division, as near as could be ascertained from keeping an average account of the force upon the work for each month, during the year 1838, is as follows:

For the quarter ending 1st March, 23 teams and 350 men.
For the quarter ending 1st June, 35 teams and 595 men.
For the quarter ending 1st Sept. 55 teams and 960 men.
For the quarter ending 1st Dec. 39 teams and 445 men.

It will be observed that there is a great variation in the force exhibited, which, so far as refers to the third and fourth quarters, is attributable mainly to the severe sickness of the past season, which still confines one hundred at least to their shantees.

The migratory character of the men employed is also a main cause for this variation, as many of them go to the south at the setting in of winter, to return in the spring There is a great deficiency of stone cutters and masons upon the line. One hundred and fifty could find immediate employment. Some endeavors have been made by the men upon the line to raise funds to build a hospital for the sick and those who may be injured by accidents at the quarries and others. Funds have been obtained to a considerable amount, and those interested desire to make its location upon State property at La Salle, should the Legislature encourage them by giving the Canal Commissioners the power to grant, or lease to them, land for this laudable purpose. When the character of the men it is intended to benefit is considered, and their utility in the construction of public works upon which there is so much to be expended in the vicinity of the point they would select for this institution, and the fact that they will incur the main expense themselves, I am induced to believe that the Legislature will he willing to grant them all the aid in their power.

Upon this division, you will have observed that there are but seven sections, or about three miles and one-half, completed. It should be stated, however, that ten sections more are so nearly completed that an average expense of $1,000, or $10,000 for the whole, would complete them. But for the sickness of the past season ten miles of the canal would have been finished. Under all the difficulties of obtaining men. responsible contractors, and the severe sickness that has visited us, the work may be said to have made such progress as to insure its completion in about two years, with adequate funds.

It would be desirable, however, to complete it as far as Marseilles by the spring of 1840, that the portion of the Western Division fed by the Fox river feeder, and upon which the work has so far advanced to completion, should be as soon as possible in successful operation.

All of which is very respectfully submitted by

Yours, &c.

WARD B. BURNETT,

Resident Engineer Western Division Ill. and Mich. Canal.

TABULAR STATEMENT showing "the work done, and the prices allowed for the various kinds of work," on the Western Division of the Illinois and Michigan Canal, up to November 30, 1838; also, the estimated value of work not under contract, and the aggregate cost of sections.

Contractors' Names.	No. of Section.	Length of section.	Cubic yards of earth excavation.	Price per yard.	Cubic yards of embodied rock excavation.	Price per yard.	Cubic yards of cemented clay and slate rock excavation.	Price per yard.	Cubic yards of quarried rock excavation.	Price per yard.	Cubic yards of detached rock excavation.	Price per yard.	Cubic yards of side culvert and brook ditches excavation.	Price per yard.	Cubic yards of protection and slope wall.	Price per yard.	Cubic yards of embankment.	Price per yard.	Grubbing, chopping and clearing.	Cubic yards of lining.	Price per yard.	Stone-dam.	Materials for structures.	Extra items.	Total amount of work done.	Amount of work to be done.	Amount not under contract.	Aggregate amount of the sections.	Structures not under contract except the two first culverts.
		chains.		*cents.*		*cts.*		*cts.*		*cents*				*cts.*		*cents.*		*cents.*				*cts.*								
Lovell Kimball	155	42	23,848	18	2,308	1 00	–	–	10	50	–	–	2,391	15½	–	–	–	–	–	–	–	–	–	–	$6,605 64	$3,250 58	–	$9,856 22	
Maus & Flood	156	57	6,633	15½	–	–	–	–	–	–	–	–	–	–	–	–	7,937	21½	–	–	–	–	$289 00	–	3,371 61	9,723 23	–	13,094 84	Culverts 16 feet chord.
Same	157	42	6,956	15½	–	–	–	–	–	–	–	–	–	–	–	–	18,240	17½	–	–	–	–	–	–	4,207 34	–	–	4,207 34	
Same	158	42	3,752	15½	–	–	–	–	–	–	–	–	–	–	–	–	5,887	19½	$40 00	–	–	–	1,138 86	–	2,908 51	11,415 76	–	14,324 27	Culvert 18 feet chord.
Same	159	42	12,008	16	187.49	1 25	1,031 40	–	–	–	89	$1 08	–	–	–	–	4,226	18	–	–	–	–	–	–	3,440 84	5,706 55	$275 00	9,147 39	Sluice or paved water-way.
Same	160	41.70	394	16	–	–	–	–	–	–	–	–	–	–	–	–	712	21	–	–	–	–	–	–	1,342 07	11,647 84	–	12,989 91	
Same	160	41.70	1,980	25	–	–	450 50	–	–	–	–	–	–	–	–	–	1,638	25	–	–	–	–	–	–	824 18	10,743 40	950 00	11,567 58	Wooden culvert 8 feet chord.
Benjamin T. Lamb	160	41.70	1,980	25	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5,036 64	7,433 62	4,629 50	12,470 26	Stone culvert 10 feet, and wooden culvert 8 feet chord.
E. McSweeny	161	42	3,297	25	–	–	–	–	–	–	–	–	–	–	–	–	357	17	–	–	–	–	–	–	528 34	10,399 74	–	10,928 08	
Armour & Knox	162	45.35	25,298	15	441	1 25	949 40	–	–	–	256	75	365	16	–	–	–	–	–	–	–	–	–	–	6,688 73	8,189 72	–	14,878 45	
P. H. Flood	163	42	2,964	17½	–	–	37 40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Glover, Roberts & Co.	164	42	15,327	16½	299	1 00	6,484 40 2,401 50	–	–	–	140	75	–	–	–	–	–	–	–	–	–	–	–	–	–	10,343 21	–	10,343 21	
Same	165	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	331 67	11,601 05	1,442 00	11,932 72	Waste-weir.
Conrad Sebaugh	166	42	574.64	15	–	–	–	–	–	–	–	–	–	–	–	–	614.62	17	–	–	–	–	3,944 00	–	5,254 62	135,214 60	20,000 00	140,469 22	Superstructure of Fox river aqueduct.
Sanger & Son	167	44.27	822	14	–	–	–	–	–	–	–	–	–	–	–	–	3,518	30	–	–	–	–	–	–	–	–	–	–	
Wm. E. Armstrong	168	42	17,404‡	15	–	–	–	–	–	–	–	–	590.88 3,854.94	15 21	–	–	32,580.85	21	–	–	–	–	–	*a* $23 00	10,373 91	–	–	10,373 91	
Same	169	42	9,274.17 4,898	15½ 15½	2,267	1 00	–	–	–	–	–	–	1,655.35	18.6	–	–	34,489.09 4,220.06	25½ 30½	–	–	–	–	–	–	12,345 53	1,800 00	1,800 00	14,145 53	Bridge.
Same	170	37.57	4,500	15	–	–	–	–	–	–	–	–	–	–	–	–	1,950	25	–	–	–	–	–	*b* 62 50	1,225 00	6,327 00	1,300 00	7,552 00	Wooden culvert 12 feet chord.
A. McK. Groves	171	42	12,318.29	18	–	–	–	–	–	–	–	–	–	–	–	–	503.14	19½	–	–	–	–	–	–	5,250 06	1,853 24	950 00	7,103 30	Wooden culvert 8 feet chord.
Harkness & Co.	171	42	15,743.34	16	–	–	–	–	–	–	–	–	–	–	–	–	2,614	16½	–	–	–	–	–	–	–	–	–	–	
Cronkhite & Co.	172	42	2,897.62	20	1,895.44	1 00	–	–	–	–	–	–	–	–	–	–	2,268.15	25	50 00	–	–	–	–	–	4,152 09	29,015 91	1,500 00	33,168 00	Lock gates.
Abner Sherman	172	42	3,463	26½	–	–	–	–	–	–	–	–	–	–	–	–	–	–	25 00	–	–	–	–	–	–	–	–	–	
Russell & Harkness	173	42	4,554.66	23.45	–	–	–	–	–	–	–	–	–	–	–	–	805	25	175 00	–	–	–	–	–	1,444 58	6,039 92	–	7,484 50	
Wm. O'Harra	174	42	481.80	16	–	–	–	–	–	–	–	–	–	–	–	–	1,783.05	25	–	–	–	–	–	–	–	–	–	–	
Wm. Mosten	174	42	681.80	16	–	–	–	–	–	–	–	–	–	–	–	–	14,337.83	25	100 00	–	–	–	–	–	7,998 01	4,715 04	1,442 00	12,713 05	Waste-weir.
John Armour	174	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	13,526	25	300 00	–	–	–	–	–	–	–	–	–	
Ezra Durgin	175	42.30	308	24	–	–	–	–	–	–	–	–	–	–	–	–	6,894.7	28	400 00	–	–	–	–	–	2,396 52	27,025 61	1,500 00	29,421 13	Lock gates.
Same	176	42	18,178	15	–	–	–	–	–	–	–	–	–	–	–	–	4,767.87	17	40 00	–	–	–	–	–	3,577 23	2,057 77	1,800 00	5,635 00	Bridge.
Johnson & Johnson	176	42.50	15,029.43	20	–	–	–	–	–	–	–	–	–	–	–	–	11,566	20	–	–	–	–	–	–	5,319 09	68 97	–	5,388 06	
Nathan Ellis	177	42	7,000	16	–	–	–	–	–	–	–	–	–	–	–	–	6,566	18	–	–	–	–	–	–	2,301 98	315 15	–	2,617 13	
A. McK. Groves	178	42	535.14	18	–	–	–	–	–	–	–	–	–	–	–	–	5,713.13	22½	45 00	–	–	–	–	–	1,621 08	–	–	–	
Michael Connelly	179	42	571.75	18	–	–	–	–	–	–	–	–	–	–	–	–	7,295.07	22½	–	–	–	–	–	–	1,774 46	5,060 10	275 00	8,761 89	Paved water-way.
Wm. Caldwell	179	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,250	24½	–	–	–	–	–	–	306 25	–	–	–	
Wm. E. Armstrong	180	43	7,066	20	–	–	–	–	–	–	–	–	2,380	16	–	–	29,801	24.78	115 00	–	–	–	–	–	8,916 60	139 90	–	9,056 50	
Kenyon & Lamb	181	42	16,791	18	–	–	–	–	–	–	–	–	575	15	–	–	7,136	18	–	–	–	–	–	–	4,777 60	4,006 04	1,300 00	8,783 70	Wooden culvert 12 feet chord.
E. McSweeny	182	42	35,700	21½	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15 00	–	–	–	–	–	7,776 75	1,812 54	–	9,589 29	
Dickinson & Clark	183	42	2,856	33	65.71	1 00	–	–	–	–	–	–	–	–	–	–	2,652	28	–	–	–	–	–	–	1,465 15	8,244 80	–	9,709 95	
E. McSweeny	184	42	27,142	21½	–	–	–	–	455.08	$1 00	1,155.65	80	700	19.87	–	–	4,136	20	18 00	–	–	–	–	–	8,199 33	5,136 10	1,300 00	18,371 03	Wooden culvert 12 feet chord.
Dickinson & Clark	184	42	20,040	21½	–	–	–	–	4,039	1 00	–	–	1,042	15	123	75	1,122	20	–	–	–	–	–	–	5,035 60	–	–	–	
Wm. O'Harra	185	42	2,980.48	25	32	1 20	–	–	–	–	236.95	1 00	–	–	–	–	738	25	12 00	–	–	–	–	–	1,217 02	11,852 34	1,442 00	13,861 46	Waste-weir.
A. A. Markle	185	42	219	25	–	–	1,091 60	–	–	–	–	–	–	–	–	–	331	25	–	–	–	–	–	–	792 10	–	–	–	
G. W. Armstrong	185	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30 00	–	–	–	–	–	–	–	–	–	
Wm. O'Harra	186	42	12,782.20	22	1,134.54	1 40	–	–	2,428.31	1 35	1,401.33	1 10	396.39	15	–	–	–	–	–	–	–	–	–	–	10,820 90	26,227 71	–	37,047 80	
A. A. Markle	186	42	34	22	899	1 10	–	–	299	1 35	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
G. W. Armstrong	186	42	–	–	179	1 10	–	–	–	–	–	–	–	–	–	–	–	–	5 00	–	–	–	–	–	30,368 80	4,918 57	950 00	35,287 37	Wooden culvert 8 feet chord.
Groves & Armstrong	187	42.14	10,063.48	33	1,292.12	1 30	–	–	–	–	–	–	753	20	–	–	3,785	29½	5 00	–	–	–	–	–	–	–	–	–	
G. W. & W. E. Armstrong	187	42.14	11,457	39	6,722	1 80	–	–	5,197	1 50	–	–	–	–	–	–	43,753.03	29½	162 00	–	–	–	–	–	17,330 59	–	–	17,330 59	
Wm. Mosten	188	42.14	8,397.97	45.43	–	–	–	–	–	–	112.84	1 00	138.57	50	–	–	25,539.26	30	315 60	–	–	–	–	–	–	–	–	11,264 12	
Benjamin F. Lamb	189	42	15,442.43	18	–	–	–	–	39	1 75	52	75	–	–	105	3 00	31,572	28	400 00	3.682	88	–	1,234 80	–	17,090 37	13,034 74	1,800 00	30,125 11	Superstructure of Pecumsagan aquoduct.
Sanger, Nichols & Beale	190	36	13,135	25	–	–	–	–	–	–	–	–	–	–	–	–	† $842 85	–	240 00	–	–	1,714 75	750 00	–	13,583 91	1,870 70	–	15,454 61	
Nichols & Beale [Pecum. chan.]		–	27,780.90	35	–	–	–	–	–	–	–	–	–	–	–	–	41,944	28	300 00	–	–	–	–	–	36,028 21	21,342 98	1,500 00	57,371 19	Lock gates.
Sanger, Nichols & Beale	191	41.37	8,194	30	15,485	1 12½	–	–	–	–	–	–	–	–	–	–	30,257.85	28	350 00	–	–	–	–	–	15,328 17	6,153 09	275 00	21,481 26	Paved water-way.
Same	192	42	6,033.06	26	8,133.2	1 50	–	–	1,626.43	1 75	1,161.73	75	–	–	–	–	40,264	28	425 00	–	–	–	–	–	22,536 80	3,100 29	–	25,637 09	
Same	193	43	5,213	26	1,326	1 50	–	–	2,652	1 75	1,718	75	–	–	2,068	75	19,315.93	30	120 00	–	–	–	7,038 27	–	22,340 51	29,341 24	5,100 00	52,681 75	Superstructure of Little Vermilion aqueduct.
James McMartin	194	35.28	941.80	20	–	–	–	–	581.22	1 25	136.84	75	–	–	2,187.31	1 07	18,962.95	30	160 00	–	–	–	–	–	–	–	–	–	
Townsend, Kinney & Byrne	194	35.28	3,367.60	20	–	–	–	–	350.78	1 25	399.73	75	–	–	–	–	41,840.21	41½	33 00	–	–	–	424 86	–	23,011 57	135,371 32	6,400 00	158,412 89	Bridge gates, &c. for two locks.
Peyton & Co.	195	28.28	6,653.53	21	–	–	–	–	407.94	1 50	151.08	1 00	–	–	–	–	798	37	–	–	–	–	1,022 50	–	–	–	–	–	
H. L. Kinney	195	28.28	4,967	25	–	–	–	–	–	–	–	–	–	–	110	1 25	–	–	17 25	–	–	–	600 00	–	19,899 91	–	–	–	
Same	196	30	51,645.4	31	–	–	–	–	–	–	–	–	2,983.28	50	–	–	–	–	18 00	–	–	–	8,187 92	–	17,702 74	169,026 83	1,500 00	221,506 73	Lock gates.
Same	197	27.88	25,733	35	–	–	–	–	–	–	–	–	980	50	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Same	196 197	–	13,692 6,563	40½ 45½	–	–	–	–	–	–	–	–	–	–	578	1 60	–	–	–	–	–	–	5,523 20	–	14,878 15	–	–	–	
For river feeder.																													
J. Green & Co.	1	51	16,510	15	8,500	1 00	–	–	–	–	–	–	–	–	–	–	32,500	17	–	–	–	–	13,081 82	–	29,583 32	4,782 65	1,500 00	34,365 97	Lock gates.
Same	2	42	890	15	–	–	–	–	–	–	–	–	–	–	–	–	11,000	16	–	–	–	–	–	–	1,880 00	4,770 00	–	6,650 00	
Same	3	42	3,700	14	–	–	–	–	–	–	–	–	–	–	–	–	50	16	–	–	–	–	–	–	526 00	3,665 50	1,752 50	4,191 50	Stone culvert 10 feet chord.
Same	4	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5,499 52	–	5,499 52	
Same	5	44	3,200	18	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	576 00	15,622 20	–	16,198 20	
Stephen Emmerson	6	42	14,616.30	16½	–	–	309 40	–	–	–	–	–	–	–	–	–	4,483.85	20	–	–	–	–	–	–	3,308 46	–	–	3,308 46	
Cronkhite & Co.	7	42	3,716.09	15	–	–	261 40	–	–	–	–	–	–	–	–	–	2,725.94	17½	–	–	–	–	–	–	2,376 51	2,299 01	1,300 00	4,675 52	Bridge.
Gallaghan & Co.	7	42	1,285.15	15	–	–	–	–	–	–	–	–	–	–	–	–	3,760	17½	–	–	–	–	–	–	–	–	–	–	
Crosier & Walker	8	89.40	20,742	20	1,070	1 00	3,200 50 300 40	–	–	–	–	–	–	–	–	–	15,265	25	–	–	–	–	–	–	10,754 65	6,935 06	–	17,689 71	
Ottawa side cut.																													
Wm. F. Walker	1	–	6,293	15	200	1 00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,143 95	22,222 17	17,000 00	30,366 12	Bridge and one lift lock of 6 feet.
	12	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	110,000 00	110,000 00	110,000 00	Four lift locks of 8 feet each.
Line above Marseilles from estimates of 1836 (not let)		29.32 * 4.93																							–	159,656 17	159,656 17	189,656 17	Two stone culverts; two wooden culverts; one waste-weir; and two lift locks of 8 feet each.
																									462,168 12	1,131,000 16	279,639 17	1,596,168 28	

* Length of feeder.

† Timber dam.

a Bridge. *b* Mowing, &c.

E.

TREASURER'S OFFICE ILLINOIS AND MICHIGAN CANAL,
Lockport, December 3, 1838.

To the Honorable the BOARD OF COMMISSIONERS
of the Illinois and Michigan Canal.

GENTLEMEN: I have so extended the limits of this my annual report as to enable me to furnish you with a statement of the entire transactions of this office for the two years last past.

This presentment of my accounts, although not required by law, will, I flatter myself, prove more satisfactory to you and to all concerned, as it will exhibit the nature and extent of the operations of this office, since the date of the last report of my predecessor. In connection herewith, see accompanying paper, marked A.

The disbursements of this office for the year ending on the 4th December, 1837, amount to - - - - -	$346,178 95
Those of the year ending on this inst., amount to -	986,355 85
Aggregate disbursements since the last biennial report	$1,332,534 80
Of this sum there was paid out for the use of the contingent fund for the year ending on the 4th December, 1837 - - - - -	$49,000 00
Ditto for the year ending this inst. - - -	105,956 37
Entire payments to this fund, for 1837–8 - -	$154,956 37

The loans authorized by the acts of the 9th January, 1836, and the 2d of March, 1837, have been obtained. Of that authorized by the first named act, $100,000 in 1836, and $400,000, the residue, in 1837. The first item, with the amount of the premium thereon, at five per cent. was deposited to the credit of the "canal fund," in the bank of the State of Illinois, on the first of July, 1837, at an interest of four per cent. until it should be, by order of the Treasurer, transferred to the Chicago Branch Bank. The remainder, stated at $400,000 with $20,000, the amount of the premium thereon, was deposited in the same institution, to the credit of the State of Illinois, on the first of January 1838, at an interest of six per cent. so long as it should stand to this credit—and when transferred to the credit of the "canal fund," by the requisitions of the Treasurer for sums none less than $105,000, to bear an interest of four per cent. until such sums should be again transferred, in sums none less than $20,000, to the credit of the Treasurer, in the Chicago Branch Bank—when all interest in favor of the "fund" was to cease.

The second loan was made in 1838, and the proceeds thereof, to the amount of $500,000 credited to the "canal fund account," on the 20th of November ult., by the "Bank of the State of Illinois."

The entire amount of interest realised from the deposites of the proceeds of loans, is $11,211 67; which is the exclusive receipt from the deposites of the proceeds of the loans, under the act of the 9th of January, 1836.

It will appear then that the entire amount of moneys borrowed up to the present date, is - - - - - $1,000,000 00
That the entire amount of premiums is - - 25,000 00
And that the aggregate amount of interest realised on loans and premiums is - - - - - 11,211 67

Aggregate proceeds of loans up to this date - $1,036,211 67

The *debit* side of the "interest account" stands thus:
Amount of interest on an over draught of $80,000 - $348 94
Amount of interest paid on two advances made by the State Bank, one of $210,000 for September 1st, another of $140,000 for October 1st, both to the 21st of November ult. - - - 4,025 00
Amount of interest due on $100,000 of canal stock, first of January, 1838 - - - - 3,150 00
Amount of interest and charges subject to be demanded by the Fund Commisioners for an advance in payment of interest due on $500,000 of canal stocks, 1st of July, 1838 - - - 15,300 00

To which may be added $3,333 33, the amount of interest paid in advance on the last sale of canal stocks, so as to make them bear interest from the 1st of January next.

The amount of sales, receipts therefrom in the forms of principal and interest, in 1837–8; the amount of bills receivable now on hand, and the amount forfeited in 1837–8, for default of payment, is truly set forth by the following table:

	Amount of sales.	Instalm'nts paid.	Interest paid.	Bills receivable.	Bills forfeited.
Sales of lots in 1836; receipts therefrom in 1837—8, &c.	1,377,113 00	18,595 10	46,997 49	166,768 90	847,470 75
Sales of lots in Lockport, November. 1837; receipts in 1837—8, &c. - - -	6,000 00	991 50	535 47	5,008 50	
Sales of lots in Lockport, June, 1838; receipts, &c. - -	4,475 00	447 50	241 65	4,027 50	
Sales of lots in Ottawa, June, 1838; receipts, &c. - -	16,910 00	1,691 00	913 14	15,219 00	
Sales of lots in La Salle, June, 1838; receipts, &c. - -	8,015 00	801 50	432 81	7,213 50	
Miscellaneous sales of wood, &c. in 1837—8 - - -	785 99	18 00	-	767 99	
	1,413,298 99	22,544 60	49,120 56	199,005 39	847,470 75

It will be seen that the sum of $22,544 60 comprises the receipts under the head of "instalments paid." Of this amount, $6,625 was paid under the act of January 9th, 1836; the balance, $15,901 60, exclusive of the receipts from miscellaneous sales, being paid under the relief and other laws passed subsequent to that time.

The amount of bills forfeited for default of payment after October, 1837, is - - - - - -	$534,255 75
The amount forfeited after the October and November payments of 1838, is - - - - - -	313,215 00
Aggregate amount of bills forfeited as stated above in 1837–8, is - - - - - -	$847,470 75

The interest account exhibits the following comparative receipts and disbursements, for the years 1837–8:

Receipts for 1837–8 - - - -	$60,332 23
Disbursements for the same time - - -	22,823 94
Balance in favor of said account for the same time -	$37,508 29

Including the year 1836, said acount stands thus,

Receipts for the year 1836 - - - -	$62,086 35
Receipts for the years 1837–8 - - -	60,332 23
Total receipts for 1836,–7–8 - - - -	$122,418 58
Disbursements for 1836 - - - -	$214 50
Disbursements for 1837–8 - - - -	22,823 94
Total disbursements for 1836–7–8 - - -	$23,038 44
Balance in favor of said account for the same time -	$99,380 14

The available means, at this time subject to the order of the Treasurer, constitutes the sum of $70,302 70; an amount inadequate, as it is thought, to meet the monthly payments to be made on the first of January next, which will approximate $100,000. The anticipated receipts from "bills receivable" now on hand for the next year may be stated at $32,717. The disbursements for the next two years, judging from the enlarged operations contemplated, and the progressive increase of expenditure, may be stated at the probable sum of $3,500,000.

In conclusion, I deem it my duty to recommend to your consideration the expediency of some judicious modification of the regulations now in force relative to the canal fund. The propriety of this measure has become evident to all who have experienced the operation of the present system of business.

The law, as it now stands, makes it the duty of the Governor to deposite all moneys raised for the use of the canal, in some bank or banks in the State. This duty having been performed by the selection of the Branch Bank at Chicago, as the depository of the canal fund, it becomes the duty of the Treasurer to check on this bank in payment of all demands against said fund—the contractors, by the arrangement, being subjected to the necessity of periodical journeys from their respective jobs to

the city of Chicago, at great expense, inconvenience, and loss of time, in order that they may get their monthly estimates.

The regulation operates particularly oppressive on the contractors of the Middle and Western Division, while, in my opinion, it possesses no particular merit to recommend it to especial favor.

JNO. A. McCLERNAND,
Treasurer Board Com. Ill. and Mich. Canal.

TREASURER

OF

THE ILLLINOIS AND MICHIGAN CANAL,

IN ACCOUNT WITH

THE BRANCH BANK AT CHICAGO.

A.

Dr. *Chicago Branch Bank in account with the Treasurer of Illinois and Michigan Canal.* Cr.

1836.			1837.		
			March 5	By amount of checks drawn in favor of contractors for work on Illinois and Michigan Canal during the quarter ending this day - -	$6,716 71
				By amount of checks for contingent fund -	3,900 00
			" 5	Balance - - - - -	297,081 53
					306,798 24
Dec. 5	To balance on deposite this day - - -	$306,798 24			
			June 5	By amount of checks drawn in favor of contractors for work, &c. during the quarter ending this day - - - - - -	50,085 59
				By amount of checks for contingent fund -	11,100 00
				Balance - - - - -	235,895 94
					297,081 53
March 5	To balance on deposite this day - - -	297,081 53			
June 5	To balance on deposite this day - - -	235,895 94	Sept. 4	By amount of checks drawn in favor of contractors for work, &c. during the quarter ending this day - - - - - -	93,351 26
Sept. 4	To cash deposited this day - - -	5,994 00		By amount of checks for contingent fund -	9,900 00
				Balance - - - - -	138,637 68
		241,889 94			241,889 94
Sept. 4	To balance on deposite this day - - -	138,637 68	Dec. 4	By amount of checks drawn in favor of contractors for work, &c. during the quarter ending this day - - - - - -	147,024 39
Dec. 4	To cash deposited during the quarter ending this day - - - - - -	35,761 73		By amount of checks for contingent fund -	25,000 00
				Balance - - - - -	2,375 02
		174,399 41			174,399 41

Dec.	4	To balance on deposite at the commencement of the fiscal year 1838 - - - - -	2,375 02	1838. March	5	By amount of checks in favor of contractors for work, &c. on Illinois and Michigan Canal during the quarter ending this day - - -	114,115 95
	22	To cash deposited this day - - -	1,559 32			By amount of checks for contingent fund -	31,000 00
1838 March	5	To amount of drafts on State Bank during the quarter ending this day - - - -	157,166 67			Balance - - - - - - - -	15,985 06
			161,101 01				161,101 01
March	5	To balance on deposite this day - -	15,985 06	June	4	By amount of checks for contractors during the quarter ending this day - - - -	183,743 50
June	4	To amount of drafts on State Bank during this quarter - - - - - -	210,000 00			By amount of checks for contingent fund -	30,000 00
						Baiance - - - - - - -	12,241 56
			225,985 06				225,985 06
June	4	To balance on deposite this day - - -	12,251 56	Sept.	5	By amount of checks for contractors during the quarter ending this day - - - -	333,081 48
July	7	To cash deposited this day - - -	4,175 96			By amount of checks for contingent fund -	33,000 00
Sept.	5	To amount of drafts on State Bank during the quarter ending this day - - - - -	377,945 00			Balance - - - - - - - -	8,281 04
			394,362 52				394,362 52
Sept.	5	To balance on deposite this day - - -	8,281 04	Dec.	3	By amount of checks for contractors during the quarter ending this day - - - -	228,623 13
Dec.	3	To amount deposited during the quarter ending this day - - - - - -	22,844 94			By amount of checks for contingent fund -	11,956 37
		To amount transferred from State Bank - -	270,000 00			By amount paid for contingent fund last quarter	486 51
						By amount of interest on overdraught - -	348 94
						Balance - - - - - - - -	59,711 03
1838. Dec.	3	To balance on deposite this day - -	301,125 98				301,125 98

JNO. A. McCLERNAND,
Treasurer.

F.

CANAL OFFICE,
Lockport, Dec. 3, 1838.

To the BOARD OF COMMISSIONERS
of the Illinois and Michigan Canal.

GENTLEMEN: By reference to former reports, it will be seen that the one made the first of June, 1837, was the last which has been laid before the Legislature. The following is a statement of the business transactions upon the canal which have passed this office since that date.

Paper number 1 contains an abstract of the several quarterly accounts of the Chicago Branch Bank sent to this office; all of which have been duly examined, and found to agree with the Bank account in the Treasurer's office, and the Treasurer's account in this.

Number 2 contains an account of all moneys expended under the order of the Board, and the heads under which the same have been charged.

Number 3 contains a list of sales of town lots in the towns of Lockport, Ottawa, and La Salle; which are all the sales which have taken place during the time covered by this present report, showing the date of sales names of purchasers, valuation by the commissioners, and amount sold for.

Number 4, is a list of the lettings on the canal, showing the dates and names of the contractors. During this time some of the sections have been more than once put under contract. In such cases, this list contains only the date of the last contract and the name of the last contractor. It contains no account of surety given by the contractors, as the law requiring of the commissioners this precautionary measure had been repealed previously to their lettings.

Number 5 is a list of officers and agents in the employment of the Board, containing the names of persons, the office or nature of employment, and the compensation allowed to each.

Number 6 is a list of supplies purchased for the use of contractors, showing the original cost, the amount distributed to contractors, and the value of the remainder at cost.

Number 7 shows the balances due from contractors for advances to them in money and supplies, over and above their monthly payments, together with the amount of the per centum retained by the commissioners out of the value of work already done by the same contractors.

Number 8 is an abstract of my account as disbursing officer for the same time, beginning with the balance in my hands on the first of June, 1837, and showing the amount of receipts and disbursements for each quarter, separately.

From the commencement of operations to the present time, there has been expended upon the work the sum of - - $1,434,838 02

From the commencement up to Dec. 1st 1836 -	$99,910 63
From December 1st 1836 to June 1st, 1837 -	70,902 30
From June 1st 1837, to December 3d, 1838 - -	1,264,025 09
	$1,434,838 02
From this deduct the amount in the hands of disbursing officers - - - - - -	11,998 95
Total amount expended - - - - -	$1,422,839 07

But a part of that sum would seem rather to have reference to providing a fund for the work than constructing the canal.

The amounts charged under the heads of canal towns -	$2,218 50
Real estate - - - - - -	3,562 98
Land agency - - - - - -	3,576 25
Total - - - - - -	$9,357 73

—all of this description.

A considerable sum has also been expended upon objects calculated to enhance the value of the canal property, and to be in themselves valuable hereafter. Of this description are the sums charged to—

Lokport office - - - - -	$4,023 06
Lockport houses - - - - -	5,665 70
Well account - - - - -	82 25
Block number 70 - - - - -	139 89
Painting account - - - - -	646 67
Warehouse - - - - - -	4,014 29
Total - - - - - -	$14,571 86

All of which is respectfully submitted.

J. MANNING,
Secretary.

No. 1.

List of the quarterly report of the Chicago Branch Bank, made since June 1st, 1837.

For quarter ending September 1st, 1837.		
Balance to the credit of the Treasurer at the commencement of the quarter - - - -		$236,268 83
Cash received during same - - - -		5,994 00
		242,262 83
Amount of Treasurer's checks paid at the Bank during the quarter - - - - - -		103,171 25
Leaving a balance to the credit of the Treasurer, of -		139,091 58
For quarter ending December 1st, 1837.		
The above balance - -	$139,091 58	
Cash received at divers times during the quarter - - -	35,761 73	
		474,853 31
Treasurer's checks paid during the quarter - -		169,923 73
Leaving balance due the Treasurer - - -		4,929 58
For quarter ending March 1st, 1838.		
The above balance - - -	$4,929 58	
Treasurer's credits during the quarter -	158,729 47	
		163,659 05
Treasurer's checks paid during the quarter - -		141,533 98
Leaving balance due the Treasurer - - -		22,125 07
For quarter ending June 1st, 1838.		
The above balance - - -	22,125 07	
Credits to the Treasurer during the quarter	210,000 00	
		232,125 07
Treasurer's checks paid during the quarter - -		224,712 84
Leaving balance due the Treasurer - - -		7,412 23

No. 1.—Continued.

For the quarter ending September 1st, 1838.		
The above balance - - -	$7,412 23	
Credits of the Treasurer during the quarter	462,120 96	
		$469,533 19
Treasurer's checks paid during the quarter	380,765 96	
Protested check - - -	80,000 00	
Order upon Board of Commissioners paid by Bank - - - -	486 51	
Interest on loans - - -	348 94	
		461,601 41
Leaving balance due the Treasurer of - - -		7,931 78
For quarter ending December 1st, 1838.		
Above balance - - -	7,931 78	
Credits to the Treasurer during the quarter	292,844 94	
		300,776 72
Treasurer's checks paid during the quarter - -		238,065 56
		$62,711 16

All of which have been examined, and found to agree with the Bank account as kept by the Treasurer.

J. MANNING, *Secretary.*

CANAL OFFICE, *Lockport, Dec.* 3, 1838.

No. 2.

Statement of the amounts expended under the order of the Board, from the 1st of June, 1837, to the 1st of December, 1838.

During quarter ending Sept. 1, 1837.		
Payments to contractors - -	$93,352 26	
Payments for contingencies -	10,114 67	
		$103,466 93
During quarter ending Dec. 1, 1837.		
Payments to contractors - -	147,024 39	
Payments for contingencies -	17,909 36	
		163,933 75
During quarter ending March 1, 1838.		
Payments to contractors - -	114,115 95	
Payments for contingencies -	8,850 43	
		122,966 38
During quarter ending June 1, 1838.		
Payments to contractors - -	159,546 49	
Payments for contingencies -	20,834 31	
		180,380 80
During quarter ending Sept. 1, 1838.		
Payments to contractors - -	344,773 66	
Payments for contingencies -	15,962 20	
		360,735 86
During quarter ending Dec. 1, 1838.		
Payments to contractors - -	228,623 13	
Payments for contingencies -	16,905 16	
		245,528 29
Total paid to contractors - -	1,087,435 88	
Total paid for contingencies -	90,576 13	
		1,178,012 01

The amount paid for contingencies has been subdivided and charged under the following heads, to wit:

Postage account - - -	$54 17	
Canal office - - -	3,960 25	
Engineering - - -	46,729 96	
Land agency - - -	3,438 25	
Incidentals - - -	16,584 92	
Treasurer's office - - -	523 14	
Lockport office - - -	4,023 66	
Lockport houses - - -	5,655 70	
Illinois and Indiana canal -	1,150 00	
Well account - - -	82 25	
Real estate - - -	3,563 98	
Block number 70 - - -	139 89	
Warehouse - - -	4,014 29	
Painting account - - -	646 67	
		90,576 13

No. 2—Continued.

The amount in the hands of the Secretary, the disburser of the contingent fund, on the 1st of June, 1837 - - - -	3,228 01	
Amount drawn from the Treasurer since that time - - - -	1,260,797 08	
		$1,264,025 09
Construction account.		
On Summit Division - -	612,587 28	
On Middle Division - -	73,662 11	
On Western Division - -	401,186 49	
		1,087,435 88
Contingent account - - - -		90,576 13
Contractors' balances - - - -		37,049 67
Balances of supplies account - - - -		36,917 74
J. Manning, Secretary, balance - - -		7,336 59
Balances of other disbursing officers' accounts - -		4,662 36
		$1,263,978 37

Canal Office, *Lockport, Dec.* 3, 1838.

J. MANNING, *Secretary.*

E

List of lots sold in the towns of Lockport, Ottawa, and La Salle, since the first day of June, 1837.

Date.	Names of purchasers.	Number of lot.	Number of block.	Valuation.	Amount sold for.
	Lots sold in Lockport.				
1837.					
Nov. 22	Lawrence O'Connar	2	11	$500	$500
	John L. Hanchett	2	23	550	550
	Chester Ingersoll	2	81	800	800
	J. M. Parks	6	81	600	600
	William Gooding	2	82	450	450
	J. B. Preston	6	82	300	300
	Edward B. Talcott	2	87	400	400
	Same	2	88	800	800
	Hiram Norton	2	94	400	400
	Isaac Hardy	2	95	250	250
	Martin Spelman	6	99	250	250
	William Williams	2	100	700	700
1838.					
June 8	John V. Singer	2	63	700	700
	A. M. Jenkins	6	68	275	275
	Chauncey White	6	88	600	600
	Benjamin Farley	2	83	400	400
	Aaron Hopkins	2	93	800	800
	John Gooding	6	100	550	550
	J. V. Singer	2	105	700	700
	Lewis Kercheval	6	112	450	450
	Lots sold in Ottawa.				
1838.					
June 19	Daniel Winlack	4	55	450	450
	Wm. E. Armstrong	6	55	350	350
	Robert E. Bradshaw	8	55	375	375
	Armstrong & Manning	14	55	500	500
	Thomas Forbes	5	56	350	350
	Aaron Baine	9	56	375	375
	Alfred Northam	1	59	375	375
	Henry L. Brush	11	59	300	300
	John and George Armour	6	64	300	300
	Michael Ryan	8	64	400	400
	Lawson Hoxsey	11	64	375	455
	A. D. Marlay	14	64	500	585
	Haskell & Kizer	1	66	525	545
	Basnett & Buchanan	5	66	400	400
	Aaron Baine	9	66	400	430
	Hoes & Leland	11	66	550	550
	Ralph Woodruff	1	85	550	550
	John and George Armour	4	85	500	500
	William Haskell	7	85	400	400
	William E. Armstrong	8	85	375	400
	Basnett & Buchanan	11	85	550	550
	Madison E. Hollister	1	86	550	600
	Alson Woodruff	4	86	600	600

No. 3—Continued.

Date.	Names of purchasers.	Number of lot.	Number of block.	Valuation.	Amount sold for.
1838.					
June 19	William Stadden - - - -	7	86	$375	$375
	Williams & Hatch - - - -	8	86	400	460
	Joseph H. Morrell - - - -	11	86	500	500
	James Armour - - - -	1	89	500	500
	Edward Hollands - - - -	4	89	550	550
	Samuel Tyler - - - -	7	89	400	400
	John V. Morehart - - - -	8	89	450	660
	Joseph Hall - - - -	11	89	600	600
	William Caldwell - - - -	13	80	300	300
	John and George Armour - -	5	90	450	450
	Barnes & Tuttle - - - -	6	90	450	450
	John & George Armour - - -	9	90	400	425
	Randolph Sizer - - - -	11	90	700	700
	Jane Best - - - - -	13	90	200	200
	Lots in La Salle.				
1838.					
June 25	Manning & McFarlan - - -	10	120	800	1,100
	Micajah Mott - - - -	10	91	375	375
	Leonard & Brown - - -	10	119	700	740
	Same - - - -	10	106	550	550
	Patrick Cunningham - - -	12	106	400	410
	Amariah Watson - - -	12	117	400	400
	John S. Dillon - - - -	3	120	450	450
	Harvey Wood - - - -	5	120	600	600
	John Allen - - - -	12	120	600	640
	John Cody - - - -	5	119	550	550
	Palmer & Parker - - -	5	118	500	500
	James Golding - - - -	12	119	550	650
	Ayres, King & Baldwin - - -	10	118	600	600
	Harpin Lindley - - - -	12	118	450	450

J. MANNING, *Secretary.*

LOCKPORT, *December* 3, 1838.

No. 4.

A list of the work put under contract since the first of June, 1837, with the names of the present contractors, including as well original contracts as those made for work previously let, and declared abandoned, and relinquished.

No. of section.	Names of Contractors.	Date of contract.
1	Madore B. Beaubien - - -	March 8, 1838.
2	Mallory & Hulbert - - -	July 18, "
3	Osborn & Stewart - - - -	" "
4	Osborn & Stewart - - - -	" "
5	Ogden & Dole - - - -	June 16, "
6	Same - - - -	" "
7	Harmons, Loomis & Raymond - -	January 22, "
8	Same - - - -	" "
9	Same - - - -	" "
10	Temple & Carver - - - -	July 9, "
11	Same - - - -	" "
12	Same - - - -	" "
13	Greenwood & Bishop - - -	June 15, 1837.
14	Same - - - -	" "
15	Same - - - -	" "
16	Greenwood, Osbourn, & Strail - -	June 16, 1838.
17	Same - - - -	" "
18	Boon & Hubbard - - - -	Feb. 20, "
19	Same - - - -	" "
20	Same - - - -	" "
21	Wilder, Butler, & Busby - - -	Nov. 16, "
22	Same - - - -	" "
23	Taylor, Breese, & Paine - - -	January 13, "
24	Same - - - -	" "
25	Montgomery, Boyd, Rigney, & Zell -	January 16, "
26	Same - - - -	" "
27	Edward Cody - - - -	June 5, "
28	Samuel H. Stedman - - -	" "
29	Cochran & Armstrong - - -	October 11, "
30	Harney & Flockhart - - -	July 12, "
31	Enoch W. Minor - - - -	January 15, "
32	James Hagan - - - -	Dec. 4, 1837
33	Smith, Yarwood, & Richards - -	July 2. 1738
34	Robert Jobson - - - -	June 5, "
35	Myers Beach, & Rood - - -	June 16, "
36	Irvin, Spafford, & Kittering - -	" "

No. 4—Continued.

No. of section.	Names of Contractors.	Date of contract.
37	Myers, Beach, & Rood - - -	June 5, 1838.
38	Same - - - -	" "
39	Irvin, Spafford, & Kittering - -	June 16, "
40	Same - - - -	" "
41	Dodd, Morehouse, & Shaw - -	June 5, "
45	Alton & Pestana - - - -	" "
46	Smith, Granger, Caton, & Judd - -	August 8, "
49	John & Samuel R. Clifford - -	Sept. 28, "
50	John Rogers - - - -	Dec. 13, 1837.
51	Hugunin & Brown - - -	February 1, 1838.
52	Same - - - -	" "
53	J. T. & D. L. Roberts - - -	Dec. 16, 1837.
54	James Brooks - - - -	January 1, 1838.
55	Same - - - -	" "
56	Stewart, Sanger, & Wallace - -	" 31, "
57	Same - - - -	" "
58	Pruyne, Negus, & Rogers - - -	Nov. 17, 1837.
59	Same - - - -	" "
60	Williams & Hardy - - -	" 14, 1838.
61	Stevens, Douglas, & Norton - -	" "
62	John Lonergan - - - -	June 5, "
63	Same - - - -	" "
64	John V. Singer - - - -	January 10, "
65	Pettibone & Root - - - -	Sept. 4, 1837.
66	Same - - - -	" "
67	Wm. B. & E. Newton - - -	Nov. 14, "
68	Same - - - -	" "
69	George Barnet - - - -	April 1, 1838.
70	Same - - - -	" "
71	Same - - - -	" "
72	Same - - - -	" "
73	Charles Kerr - - - -	August 1, "
74	Sterling, Blanchard & Co. - - -	June 5, "
75	Same - - - -	" "
76	James Ryan - - - -	" "
77	Steel & Amer - - - -	Oct. 18, "
78	Matteson & Ryan - - -	" "
79	N. & S. S. Davis - - - -	June 5, "
80	Samuel R. Bradley - - -	Nov. 24, "
81	McLaughlin, Lawless & Co. - -	August 7, "
82	Jeremiah Crotty - - - -	" "

No. 4—Continued.

No. of section.	Names of Contractors.	Date of contract.
83	Jeremiah Crotty - - - -	August 7, 1838.
84	Angus P. McDonald - - -	June 5, "
85	Hendricks & Rush - - - -	" 16, "
86	Same - - - -	" "
87	Same - - - -	" "
88	Richard Morris - - - -	" 5, "
89	Gay & Manning - - - -	" "
90	Same - - - -	" "
91	Lot Whitcombe - - - -	Nov. 1, "
92	Wm. A. Chatfield - - - -	June 16, "
93	Benjamin M. Webber - - -	" 5, "
94	John Hassack - - - -	" 16, "
95	Same - - - -	" "
96	Hendricks & Rush - - - -	" "
97	Same - - - -	" "
98	Sherburn & Gobin - - - -	" 5, "
99	Obed Smith - - - -	August 7, "
100	Same - - - -	June 5, "
101	Caldwell & Mulligan - - -	Sept. 14, "
102	James Drummond - - - -	Nov. 1, "
103	H. D. Risley - - - -	June 16, "
104	Clifford & Stewart - - - -	" 5, "
105	Crawford & Harveys - - -	Oct. 31, "
106	Same - - - -	" "
107	Same - - - -	" "
108	Same - - - -	" "
160	Benjamin F. Lamb - - - -	June 5, "
161	Edward McSweeny - - -	Sept. 7, "
162	Armour & Knox - - - -	August 1, 1837.
163	Patrick H. Flood - - - -	Sept. 7, 1838.
164	Glover, Roberts, & Matson - - -	Oct. 19, 1837.
165	Same - - - -	" "
166	Conrad Seabaugh - - - -	January 3, 1838.
167	David Sanger & Sons - - -	June 5, "
170	Wm. E. Armstrong - - -	Dec. 4, 1837.
171	Wm. & Thos. Harkness - - -	March 21, 1838.
172	Abner Sherman, Jr. - - -	Sept. 28, "
173	Russell & Harkness - - -	" 1, "
174	John Armour - - - -	July 2, "
178	Nathan Eels - - - -	August 22, 1837.
179	William Caldwell - - - -	Sept. 12, 1838.

No. 4—Continued.

No. of section.	Names of Contractors.	Date of contract
181	Kenyon & Lamb - - - -	August 22, 1837.
183	Dickinson & Clark - - - -	July 2, 1838.
184	Same - - - -	" "
185	George W. Armstrong - - -	Nov. 5, "
186	Same - - - -	" "
187	G. W. & W. E. Armstrong - -	" 15, 1837.
194	Townsend, Kinney, & Byrne - -	January 20, 1838.
195	Henry L. Kinney - - - -	Sept. 6, "
196	Same - - - -	" "
197	Same - - - -	" "
	Fox river Feeder.	
1	Greene, Stadden, & Dunevan - -	Nov. 14, 1837.
2	Same - - - -	" "
3	Same - - - -	" "
4	Same - - - -	" "
5	Same - - - -	" "
6	Stephen Emmerson (completed) - -	" "
7	Francis Chambers - - - -	August 13, "
8	Crosiur & Walker - - - -	March 21, "
	Locks.	
1	George Barnet - - - -	June 5, 1838.
2	Same - - - -	" "
3	Charles Kerr - - - -	August 1, "
4	Same - - - -	" "
6	Hall & Grant - - - -	June 5, "
7	Same - - - -	" "
11	Beale & Cooper - - - -	July 24, "
12	Armstrong & Johnston - - -	Nov. 10, "
13	Durgin & Witham - - -	June 5, "
14	William Byrne - - - -	" "
15	Cooper & Twitchell - - -	" "
	Aqueduct of Little Vermilion.	
	William Byrne - - - -	Oct. 8, "
	Aqueduct of Pecumsagan.	
	Thomas Beale - - - -	" "

No. 4—Continued.

No. of contract.	Names of Contractors.	Date of contract.
	Aqueduct of Fox river.	
	David Sanger & Sons - - - -	June 5, 1838.
	Aqueduct of Du Page.	
	Robert Watson - - - -	August 7, "
	Dam Number 1, & Lock Number 5.	
	Wilson, Brodie, & Co. - - -	June 5, "
	Dam Number 2 & Guard lock.	
	Charles Kerr - - - -	" "
	Lateral Canal at Ottawa.	
1	Wilburn F. Walker - - -	Nov. 24, "
	Culvert Number 1.	
	Samuel Howard - - - -	June 5. "
	Culvert Number 2.	
	Patrick H. Flood - - - -	" "
	Du Page Feeder.	
	N. & S. S. Davis - - - -	August 8, "

J. MANNING, *Secretary.*

LOCKPORT, *Dec.* 3, 1838.

No. 5.

List of officers and agents in the employment of the Board.

Names.	Office, &c.	Compensation.
William Gooding - -	Chief Engineer -	$3,500
E. B. Talcott - -	Resident Engineer -	2,000
William Jerome - -	Same -	2,000
W. B. Burnett - -	Same -	2,000
J. L. Hanchett - -	Junior Assistant Engineer	1,250
M. A. Gooding - -	Same -	1,250
A. J. Mathewson - -	Same -	1,250
J. B. F. Russell - -	Same -	1,250
O. S. Jerome - -	Same -	1,250
M. Benjamin - -	Same -	1,250
John Green - -	Same -	1,250
Michael Ryan - -	Same -	1,250
J. B. Preston - -	Same -	1,250
William P. Whittle - -	Rodman -	600
R. E. Heacock, jr. - -	Same -	600
Stephen Gooding - -	Same -	600
Thomas Henry - -	Same -	600
Robert Elder - -	Same -	600
Jacob Leopold - -	Same -	600
Peter Stewart - -	Superintendent of masonry	
J. Manning - -	Secretary -	1,750
J. Rucker - -	Treasurer's Clerk -	1,000
R. McFarlan - -	Clerk -	800

J. MANNING, *Secretary.*

LOCKPORT, *December* 3, 1838.

No. 6.

Articles purchased for the use of the contractors to aid in their work.

Articles.	Cost.	Amount distributed.	Balance.
Powder account, No. 1 -	$4,000 00	$4,000 00	
Flour account, No. 1 -	6,030 00	5,217 50	$812 50
Pork account, No. 1 -	16,100 25	11,702 00	4,398 25
Powder account, No. 2 -	24,155 98	12,016 00	12,139 98
Pork account, No. 2 -	4,485 21	4,432 00	53 21
Flour account, No. 2 -	6,876 00	4,529 00	2,347 00
Pork account, No. 3 -	2,731 88	2,502 00	229 88
Canal stores—consisting of iron, steel, cordage, tools, &c. -	26,777 45	9,840 53	16,936 92

J. MANNING, *Secretary.*

CANAL OFFICE,
Lockport, December 3, 1838.

No. 7.

A list of Contractors to whom advances have been made in money and supplies, showing the balance due from them for such advances, and the amount of the per centage retained upon work already done by them.

Names of such Contractors.	Advance	Per cent.
H. D. Risley	$168 23	87 05
Sanger, Nicholls, and Beale	631 68	9,163 08
Wm. E. Armstrong	84 28	1,521 24
Nathan Eels	157 94	345 29
John V. Singer	2,329 55	2,547 00
James Brooks	459 57	2,804 19
Crosiur and Walker	1,162 84	1,613 19
Henry L. Kinney	7,000 00	2,462 27
David Sanger and Sons	40 00	788 19
J. T. and D. L. Roberts	600 00	1,807 66
Cochran and Armstrong	72 00	44 74
Harvey and Flockhart	54 00	253 44
James Spence	600 00	1,217 24
Greenwood and Bishop	306 00	4,997 28
Hugunin and Brown	500 00	5,263 62
Maus and Flood	352 80	1,413 39
Conrad Seabaugh	780 00	49 75
Edward McSweeny	381 00	1,290 13
G. W. and W. E. Armstrong	1,040 00	2,642 20
James Hagan	104 00	116 25
James Drummond	30 34	39 32
Temple and Carver	815 00	1,658 92
Boon and Hubbard	537 50	1,310 17
Wm. B. and E. Newton	1,998 13	1,910 11
E. W. Minor	36 00	374 79
Steel and Amer	85 53	115 75
Montgomery, Boyd, Rigney, and Zell	103 48	1,113 15
Dickinson and Clark	18 00	1,204 99
Obed Smith	4 00	99 18
Hall and Grant	51 64	31 50
T. Y. Vannest	421 00	229 43
John Lonergan	929 24	3,260 74
Wilson, Brodie and Co.	551 37	439 15
Samuel Howard	16 00	170 80
Glover, Roberts, and Matson	300 00	1,003 30
N. and S. S. Davis	510 25	655 23
Beach, Rood, and Co.	58 34	726 22
Harmon, Loomis, and Raymond	39600	3,232 47
George W. Armstrong	288 40	29 53
Smith, Granger, Caton, and Judd	500 00	606 30
James Ryan	488 13	951 84
Pettibone and Root	477 50	1,298 01
Wm. A. Chatfield	18 00	245 37

No. 7—Continued.

Names of such Contractors.	Advance.	Per cent.
Benj. M. Webber - - - -	$10 86	$90 50
Osborne and Stewart - - - -	154 53	804 96
Williams and Hardy - - - -	182 10	90 30
Pruyne, Negus, and Rogers - - -	5,803 48	4,334 62
Lovel Kimball - - - - -	132 00	998 84
Crawford and Harveys - - -	76 00	136 26
Stewart, Sanger, and Wallace - - -	2,188 37	5,087 41
Stevens, Douglas, and Norton - - -	160 00	105 00
Wm. Avery - - - - -	1,580 98	3,445 88
John Rogers - - - -	873 61	3,271 78
Isaac Hardy - - - -	450 00	
	37,049 67	79,431 04

The total amount of the balances due from contractors for advances to them, over and above their monthly payments, made in money and supplies to aid them in their work - - - - - $37,049 67

The total amount of the per centum retained by the Commissioners, out of the monthly estimates of work already done by the same contractors - - - - - $79,431 04

J. MANNING, *Secretary.*

LOCKPORT, *Dec.* 1838.

No. 8.

J. MANNING, *Secretary and Disbursing Officer in account with the Board of Commissioners of the Illinois and Michigan Canal.*

DR.		CR.	
1837.		1837.	
June 1. Balance in the hands of the Secretary	$3,228 01	September 1. Amount of disbursements during the 3d quarter of 1837.	$10,114 67
September 1. Amount received during the 3d quarter of 1837	19,900 00	December 1. Amount of disbursements during the 4th quarter of 1837	18,511 92
December 1. Amount received during the 4th quarter of 1837	15,602 50	1838.	
1838.		March 1. Amount of disbursements during the 1st quarter of 1838	41,936 33
March 1. Amount received during the 1st quarter of 1838	35,998 87	June 1. Amount of disbursements during the 2d quarter of 1838	30,482 00
June 1. Amount received during the 2d quarter of 1838	32,834 31	September 1. Amount of disbursements during the 3d quarter of 1838.	62,014 17
September 1. Amount received during the 3d quarter of 1838	66,418 47	December 1. Amount of disbursements during the 4th quarter of 1838	38,996 10
December 1. Amount received during the 4th quarter of 1838	35,409 56	Balance	7,336 59
	$209,391 78		$209,391 78
To balance brought down	$7,336 59		

LOCKPORT, *December* 3, 1838.

J. MANNING, *Secretary*

G.

CHICAGO, *October* 23, 1837.

To the BOARD OF COMMISSIONERS
of the Illinois and Michigan Canal.

GENTLEMEN: Having been appointed by your honorable Board, under the 3d section of the law of the State of Illinois, of March 2, 1837, "to survey and examine the route of the canal as now established, with a view of ascertaining whether there is a sufficient quantity of water, within the legitimate authority of the State of Illinois to use, to supply a canal of the same size and dimensions as the one now contemplated to be constructed upon the Summit level of said line of canal;" I have, in pursuance of the duties here pointed out, passed over the whole line of canal from lake Michigan to Peru, examined all the plans and profiles, and received explanations and descriptions of every part of the work as projected and marked out, as well as all those parts now in progress of working under contract; and I think I may say I have now possessed myself of a full knowledge of the details of the work, as designed by your chief engineer, in all its localities and bearings upon the very important question of water, upon which I am required to act.

It appears by act of the Legislature above referred to, that "a supply of water from sources within the *legitimate* authority of the State of Illinois," was to govern all actions upon this matter, and that your Board had early directed Fox river to be more fully examined than had heretofore been done.

From an examination of the various canal documents of the last session of the Legislature, it seems that the question stands as follows:

Shall the feeding water be taken from lake Michigan by a deep cut? or, shall the Summit be raised ten feet above the lake, and fed from streams to be brought into it? It has been supposed, and no doubt correctly, that only three streams of water can be brought on the Summit level—1st. The Des Plaines river; 2d. The Calamic river; 3d. The Fox river.

The Des Plaines was not in a proper situation to gauge, as there had been copious rains; I therefore take the former measurements of the United States engineers, as stated in the reports of the canal committee, at 54,800 cubic feet per hour.

By calculation it is found that, if twelve boats pass per hour, the lockage water to lock up and down ten feet will be 475,200 feet per hour. If we then add for leakage at the locks (a small item) and for the evaporation, we ought not to say less than 500,000 cubic feet of water per hour will be required, when boats are passing as fast as they can be let through (or twelve per hour.) It is true that, if boats passing each way were to meet so as to pass a boat up with the same water which passed one down, then only half the above amount of lockage water should be estimated for the twelve boats per hour, although, I believe twelve boats per hour may be passed each way, if the locks are well attended, and are in perfect order for filling and discharging the water rapidly.

These premises being admitted, we have to look for 445,200 cubic feet of water per hour more than the Des Plaines gives us at low water.

The Calamic takes it source in the State of Indiana, and by a bend passes into this State, and its present entrance into lake Michigan is within

the State. It is, however, well known that its former entrance into the lake was in Indiana, and that it often has a discharge of its waters at the latter place in a particular stage of the waters of the lake. It is found by examination that the waters of Calamic must be raised by a dam near the mouth of Stony creek (or Rock creek) about six or seven feet, in order to feed a canal; and if used for feeding with a copious supply of water, there should be a descent of at least two inches in each mile. This would increase the height of the dam to nine feet nearly above the present surface of water.

The effect of such a dam would be to make back-water, for many miles, into the State of Indiana; and when we look at all these facts, it is an undeniable truth that the waters of the Calamic are not the "legitimate waters of the State of Illinois." To get feeding waters for a canal on a high level, we must therefore look to Fox river. Before my arrival in this State, your Board had very judiciously and properly directed Capt. Burnett, with his party, to examine the country between the Fox river and the Des Plaines, beginning at the point on Fox river near Elgin, where former examinations had ended, and extend north to the line of the State.

Capt. Burnett's report on this survey is now herewith annexed, together with a sketch of the topography of the country, and which gives a very satisfactory account of what resources of water can be obtained from Fox river.

The next feasible plan of obtaining water from Fox river is from a point in Pistaka lake, six or eight miles below the State line; and thence by a cutting designated by a red line on the map, to let the waters of Fox river into Mill creek, a branch of the Des Plaines; and from thence let them follow the bed of Mill creek and Des Plaines for forty or fifty miles before they arrive at the canal where they can be received into it.

By the plan proposed by Capt. Burnett, (and which I fully approve) a dam is to be erected across Fox river to raise its waters two feet only, (as that is all the descent in the river from the State line to the proposed dam;) a cutting, rising from nothing to 53⅓ feet, is then to be made for 12⅓ miles.

This cutting appears by Capt Burnett's report to be fair, and without rock. The amount of excavation for a cut sixteen feet on the bottom, and slopes two to one, with the water four or five feet deep, (and it then would be a doubtful question whether it would pass through the quantity required,) with the proposed descent of three inches per mile, admitting that it would discharge the quantity required, the cost would be thus:

3,176,520 cubic yards, at 30 cents - - - - -	$952,956
Dam across Fox river (on bad bottom) - - -	20,000
Contingencies, engineering, &c. 5 per cent. (say) -	45,647
	$1,018,603

We have here an outlay of more than one million of dollars. Capt. Burnett estimated the rise of water in Fox river, above its lowest state, at two feet, and by measurement he found the stream gave 25,000 cubic feet per minute. If we take half of this quantity as its minimum, at the

lowest water, we allow all that it will give, and perhaps more, 12,500 x 60 = 750,000 per hour. As this water has to run, probably fifty miles, in the marshy bed of the Des Plaines and Mill creek, where it is very sluggish, and will be several days in reaching the canal through Mill pond, &c., it is not too much to say that we might lose one-fourth of it by evaporation in a severe drought and hot sun.

In this calculation I have supposed the whole of Fox river in its lowest state to be brought through. Now we cannot expect that we shall have a perfectly tight dam; we shall lose much there; and as we have only 750,000—187,500=562,500 x to 54,800 equal to 617,300 cubic feet of water from both these rivers, and we want certainly 500,000 feet; and upon the most favorable calculation, we have only the 617,300 to rely upon. It is true this quantity might be increased considerably by making reservoirs of several little lakes at the head of Mill creek.

If we admit that an ample supply can be obtained from this source, we ought, before adopting the plan, to look at the consequence of taking the waters of Fox river, and what would be the effect of throwing so much water into the bed of the Des Plaines. Would it not prevent the several large tracts of low (*very low*) prairie land from being drained, and brought under cultivation? If I have been correctly informed, this would be the effect; and this is of very great moment, not only in preventing this land from being cultivated, but endangering the health of the people in the surrounding country.

The great objection to this immediate section of country is, that the lands do not drain freely; and for a permanent work, like the Illinois and Michigan canal, all the plans should be adopted, in reason, to make every part of the land more valuable by the drainage which the plan and the construction of the canal may give. The Illinois and Michigan canal, as now projected, and under construction may truly be considered as one of the greatest and most important, in its consequences, of any work of any age or nation. In looking over this connection between the lakes and the Mississippi, it is no doubt superior in its advantages to any other which can ever be formed. It is the shortest artificial work, with the least lockage. The climate, soil, and the capability of productions of the country which will be benefitted by the construction of this work, will certainly equal, if they do not exceed, any other part of the United States; and when I view it in this light, I think it justly merits to be executed upon the best and most permanent plan, and will justify, by its revenue, any outlay which may be put upon it in reason.

Taking a view of the whole ground, and looking at the probable cost of the deep cutting, of the low level, and the length of time it will take to accomplish it, and the time the country will lose the benefit; looking, also, at the great good to the country, and the pecuniary advantage to the State and the canal, by the creation of water-power at Lockport, and Juliet, I have no doubt upon my mind that the present plan of cutting down the Summit, so as to draw feeding water from lake Michigan, ought to be continued, in preference to any other which I can suggest.

In my remarks I have not entered into calculation to show the many expenses and losses which would result from raising the level ten feet—such as the extra lock keeper, annual repair of locks, loss to the country and State, by not having water-power—the advantages of vessels of large

size reaching Lockport before unlading, or lading—these and many other considerations have a bearing upon this question; and I might say would admit the case to be stated by putting down the expense of the low level, and then deducting the additional value given by water-power to the State property at Lockport and Juliet, and the drainage of the State land otherwise, on one side—and on the other, the cost of the high level, with two locks—the cost of the attendance (brought into capital)—the cost of introducing Fox river, and other contingencies—such as damages for the injury done to lands along the Des Plaines; and I fully believe the balance would be in favor of drawing the feeding water from lake Michigan. In these remarks and opinions, I believe I have fully complied with the act directing the appointment. I shall, however, in another communication, comply with your wishes in regard to the details of the work, in its location, and the various points of difficulty in construction, and make full remarks upon every point.

Respectfully submitted by

Your obedient servant,

BENJ. WRIGHT,

Civil Engineer.

CHICAGO, ILL., *October* 20, 1837.

To B. WRIGHT, Esq.

Civil Engineer.

SIR: In compliance with a law passed by the Legislature of Illinois, and approved March, 1837, I have been instructed by the Board of Commissioners of the Illinois and Michigan canal to examine the dividing ridge of the Fox and Des Plaines rivers, within the limits of this State, to ascertain the most eligible route for conveying the waters of the Fox river to supply the Summit Division of the Illinois and Michigan canal, and to report to you for your consideration the results of that examination.

The variety of opinions entertained upon the feasibility of this mode of feeding the Summit Division, and the great importance of the subject, has led to the examination of many summits, which a reconnoissance alone might have pronounced impracticable.

In ascending the Fox river, the first summit met with, having a considerable depression, is that of Popple creek, which empties into the Fox, about one mile below Elgin, and has its rise with the head waters of the Du Page; thence the depression is continued by the western branch of Salt creek, and Salt creek itself into the Des Plaines. This summit was thoroughly examined last year, and by reference to the level obtained, found totally impracticable.

The depression of Lake and Flint creeks, discharing their waters into the Fox, and having their rise with the head waters of the northerly branch of Salt creek, Buffalo creek, and Indian creek, three branches of the Des Plaines river, were next examined. By these depressions a summit cannot be obtained of less than ninety feet above the surface of the Fox at the mouth of Flint creek.

The next depression examined was that of Slocum's and Bang's lakes,

which head in extensive sloughs opposite to the head waters of the northerly branch of Indian creek. This route presents a summit ridge of about 100 feet, above the surface of the Fox, at the outlet of the lake.

The summit of the southerly branch of Deer, or Squaw creek, was next examined, so far as to show an elevation above the Fox, at the mouth of said creek, of 20 feet, when it was discovered that it takes its rise near the head waters of Indian creek, which were known to be too much elevated for our purpose.

The summit of Round lake, which is one of a chain of lakes discharging themselves into the Fox at a point about six and a half miles from the State line; and Fourth lake, one of another chain forming the southwesterly branch of Mill creek, which discharges itself into the Des Plaines river, at a point about five miles below the State line, was next examined, and found to be, at the close of our examinations, the most favorable route. The next depression examined was that of Silver creek, which discharges itself into the Fox river about two miles south of the State line. This depression connects itself with Silver lake; then crossing a high ridge about three quarters of a mile, descends, by a broad slough, to one of the lakes which form the northerly branch of Mill creek, and by said creek to the Des Plaines river.

This route would be the shortest of any, being estimated at about one half mile shorter than the Round and Fourth lake route, but the difference in level of the summits of these two routes is so decidedly in favor of the latter that a further comparison is deemed unnecessary.

There is still another depression, of which Cross lake, immediately upon the State line, is the summit. The surface of that lake is 74.385 feet above the present surface of the Fox at the State line; and in following the depressions connected with it, if it were practicable or desirable to do so, we should be compelled to go beyond the limits of the State.

The most favorable route for passing the dividing ridge having been ascertained, the valley of Fox river was examined, from the State line downward, with reference to guaging the discharges of the river, and selecting the most eligible point for a dam. The surface of the river at the State line was supposed to be, from the best information to be obtained, about 2 feet above its lowest stage, and 1.75 below its highest, and to discharge, at the most favorable point for gauging, more than 25,000 cubic feet per minute. From several miles north of the State line, the river has but little fall, and south of it, it has only descent of about one and a half feet per mile for one and a half miles, when it loses itself in the Pistaka lakes, which to a great extent are filled with a floating sag, high grass and wild rice. The waters of the Fox, after passing through these lakes, and receiving the Nepusink and other branches, emerges from the most southerly of the group, with a clear, deep, and distinct channel, being at the outlet about 330 yards wide, and from three and a half to nine and a half feet deep. The most eligible point for a dam is believed to be at the Indian grave, three quarters of a mile below that point. The river there is about 220 yards wide, and from five and a half to seven feet deep, with a light gravel and sandy bottom; the west bank is about thirteen feet high, the east bank consists of a high knoll, connected with the main ridge by low ground, which is about thirty-five yards wide. In case a dam should be located upon this site, an embankment will be required across this low ground. The de-

scent of the waters of the Fox to the outlet of Round lake, is 6.150 feet. The estimated descent to site of dam, two miles further south, 7.500 feet—on account of the very slight descent of the waters of Fox, within the State limits, and the low nature of the country in the vicinity of the Pistaka lakes. The surface of the most easterly of these lakes is assumed at two feet only above its present level at the outlet of Round lake, where it is proposed to take out the water for the feeder.

An experimental line has been run from this point across the Round lake and Fourth lake summit to the mouth of Mill creek, on the Des Plaines river, to ascertain the amount of excavation necessary to accomplish the object of the survey. The Des Plaines river was found to be 75.500 feet below the point of commencement, and the summit or deepest cutting to be 53.305 feet; and the length of said line before the waters of the feeder could discharge themselves into the Des Plaines river, by the valley of Mill creek, is 12 miles 696 yards.

An estimate of the quantity of excavation necessary has been made from the data of the dimensions and declivity that you recommended, viz: sixteen feet bottom, slopes of two to one, and a declivity of three inches per mile, and was found to be about 3,176,520 yards. The only indication of rock observed in the survey of this summit was occasional detached pieces of silicious lime rock. About one half mile of the line below Long lake passes through a marsh which it will be difficult to drain, and about one mile and a quarter is located in the beds of Round and Fourth lakes.

All which is respectfully submitted by

Your obedient servant,

WARD B. BURNETT,

Resident Engineer Illinois and Michigan Canal.

Lockport, Illinois,
November 30, 1837.

To the Board of Commissioners
of the Illinois and Michigan Canal.

In the prosecution of surveys in the vicinity of Fox river, authorized by the Legislature of this State in March last, I was instructed by you to make such an examination of the nature of the valley of that stream, within the State limits, as would be useful in determining the most feasible manner of improving its navigation.

In compliance with these instructions, a continuous compass and level line was run upon or near the banks of the Fox, between the navigable feeder of the Western Division of the Illinois and Michigan canal, at Green's mills, and the State line. This preliminary survey was made in the latter part of the month of October; and, as my party have been almost exclusively engaged since that period upon other estimates and plans, it has been impossible to prepare those belonging to the Fox river in time for your annual report. The maps and estimates are now commenced, all of which will be presented with my report, as soon as they are completed.

In the meantime, as it may be thought desirable to know the general results of the survey and the feasibility of its object, I have formed from

our field books a condensed statement of the difference of level of the surface of the Fox, at those points of the river the most known, with their respective distances from each other, and the point of commencement.

The surface of the Fox, at the time of the survey was, from the best information to be obtained, from one and a half feet, in the most rapid portions of it, to two and a half feet in the more sluggish above low water; and from one and three-fourths feet to three and one-fourth feet, below high water.

The following statement of levels has been made out from the surface of the proposed feeder-dam at Green's mills, taken at zero; and the distances are such as were obtained by the survey; to which, as the river banks were not meandered closely in some distances, should be added about four miles, in order to obtain the whole length of navigation required.

From	To	Distance.	Whole distance.	Difference of level.	Whole difference of level.
	Surface of feeder-dam - - -	0	0	0.000	0.000
Feeder dam - - - - -	Buck creek - - - - -	4,09.49	0	no level	taken.
Buck ceeek - - - - -	Indian creek - - - -	73.00	5,02.49	16.915	16.915
Indian creek - - - - -	Foot of Barnsford's dam - - -	1,13.50	6,15.99		
Barnsford's dam - - - -	Foot of Potter's dam - - -	13,36.61	19,52.60	34.905	51.820
Potter's dam - - - - -	Foot of Jackson's dam - - -	1,15.50	20,68.10	2.075	53.895
Jackson's dam - - - -	Blackberry creek - - - -	8,43.25	29,31.35	26.600	80.495
Blackberry creek - - - -	Foot of dam at Aurora - - -	12,48.50	41,79.85	55.290	135.785
Aurora - - - - -	Foot of Stolp's saw-mill dam - -	2,21.00	44,20.85	10.930	146.715
Stolp's dam - - - - -	Foot of Gibson's mill dam - - -	1,08.00	45,28.85	7.255	153.930
Gibson's dam - - - - -	Foot of Boardman & Co.'s mill dam -	3,52.80	49,01.65	13.535	167.465
Boardman & Co.'s dam - - -	Foot of dam at Geneva - - -	2,18.40	51,20.05	14.995	182.460
Geneva - - - - -	Foot of dam at Charleston - - -	1,66.00	53,06.05	9.935	192.395
Charleston - - - - -	Foot of Knox & Collins' dam - -	7,53.04	60,59.09	16.290	208.685
Knox & Collins' - - - -	Surface of water at B. M. near Elgin -	2,23.00	63,02.09	4.015	212.710
B. M. at Elgin - - - -	Foot of Gifford's dam - - -	1,17.00	64,19.09	3.520	216.220
Gifford's dam - - - - -	One and a half miles below Narrows -	6,40.00	70,59.09	17.660	233.880
One and a half miles below Narrows -	Lake creek - - - - -	7,24.00	78,03.09	8.570	242.450
Lake creek - - - - -	Flint creek - - - - -	4,15.00	82,18.09	2.040	245.490
Flint creek - - - - -	Outlet of Slocum's lake - - -	4,45.33	86,63.42	3.505	248.995
Outlet of Slocum's lake - - -	Mouth of Nepasink - - - -	10,40.00	97,23.42	7.760	254.755
Mouth of Nepasink - - - -	State line - - - - -	7,40.00	104,63.42	7.650	262.405

Whole distance, as per survey - - - - - - - - - 104,63.42
To which add four miles for slight deflection of bank not closely followed - - - 108,63.42 262.405

In ascending the Fox river from the feeder-dam, its general course to Aurora, including some extensive bends, is about northeast; and above that place to the State line it is nearly north.

The difference of level of its surface in the whole of that distance is 262.405 feet; and with reference to the foregoing statement, it will be seen that the most of this difference is found from and below the village of Charleston, almost all of it being below a remarkable contraction in the width of the river, called "the Narrows;" above which there is little fall. Thus we have three divisions of the river that differ essentially in their descent—the first having an average difference of level at the surface of about 3.6 feet, (and in some cases 5 feet per mile;) the second of 2.2 feet per mile; and the third an average of 0.87 feet per mile. These divisions differ from each other almost as distinctly in the nature of their banks—the first having them abrupt, and occasionally of high bluff rock; the second having them very favorable for a tow-path; and the third, including the Pistaka lakes, having a great extent of low marsh upon either bank; on which, for a great distance, it would scarcely be possible to construct a tow-path.

This variety in the nature of the banks of the Fox and its descent is such that more consideration is required for the arrangement of the particular parts of its proposed improvement; and in order that a nearer approximation may be made, by estimate, to the expense of this important work, than the results of a preliminary survey can afford, I wish to visit some points of the river again, before making my report.

Without further examination, I believe the most feasible plan for the contemplated improvement is that of slack-water navigation, with a tow-path upon the most favorable side of the river, except in some places, where it will be advisable to construct short lines of canal.

All of which is respectfully submitted by

Your obedient servant,

WARD B. BURNETT,

Resident Engineer Ill. and Mich. Canal.

H.

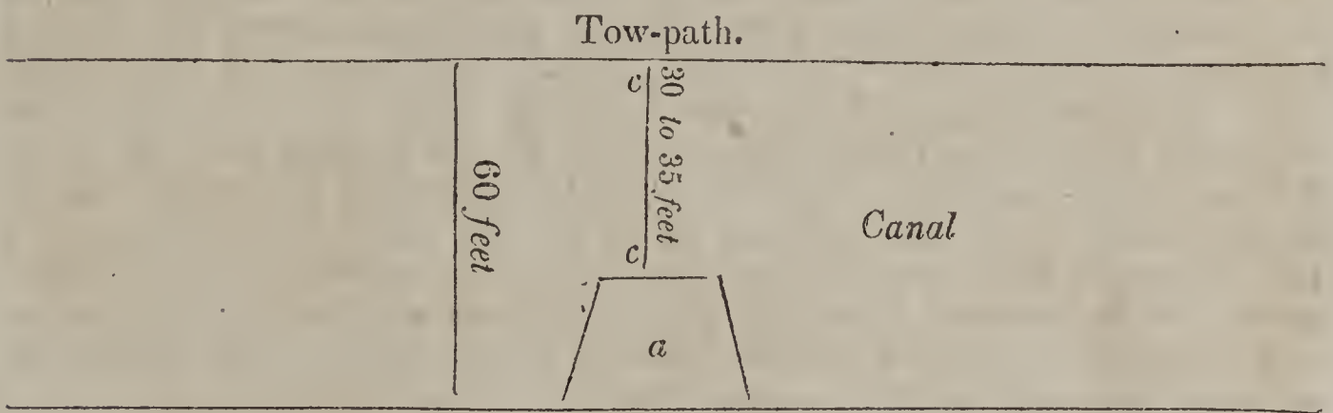
CHICAGO, *Oct.* 25, 1837.

To the BOARD OF COMMISIONERS
of the Illinois and Michigan Canal.

GENTLEMEN: Having passed over the line of the canal from Chicago to Peru, and obtained, through your chief engineer, a knowledge of the plans of the intended works of art, as proposed by him, as also the various plans intended to be pursued in the execution of the very expensive parts of the excavation, and security of certain points,—I now take pleasure in complying with your request in answering various questions in relation to the work.

1st. Will a guard-lock be necessary at Chicago river? I do not think I should build any guard-lock. If I understand this case correctly, the use of a guard-lock would be to shut out the water from the lake.

If, as a precaution for safety, to guard any part of the 30 miles summit, it should not be so far distant from the locks at Lockport. The mile or two next to and above the locks at Lockport, is the only place where any breach can happen in this level, and that can be secured better than by a guard-lock so far off as 30 miles. There are various plans for securing against any breach in the embankment at Lockport, such as the following: Select a place of rock cutting about 10 feet deep, as near to Lockport as can be found, where the rock lays close, and as few fissures as possible —contract the canal to 30 or 35 feet thus:



and leave a block of rock, as at *a*, ten or twelve feet high—cut the face *c c* with care, and place in gates, in the manner as described to me by Mr. Talcott, and intended by the chief engineer, Mr. Gooding. These, if properly fixed to rest on the bottom until raised, will be ample security, and can be attended to instantly upon any appearance of a breach. Wickets should be made in one of the gates, and a timber may be thrown across for the top of the gates to rest against, if necessary. If the Board do not choose to make the gates, a heavy timber of 15 inches square, laid across, and plank 4 inches thick put down on the bottom of the canal, at an angle of 45°, with a little straw and fine stuff placed above, would stop the water in 2 hours.

A waste-weir has been projected of 500 feet long, at some proper point, (say where the rock cutting is about 4 feet,) and build good masonry with water cement upon this rock, to the top water line; and in order to have additional security, I would have a number of gates placed in the masonry, that could be raised, and let out water very rapidly at pleasure.

The value of the water-power at Lockport will be in demand as soon as the water is in the canal; and to prevent breaking the bank to take out water, I would advise that a water cement wall be built, with the stone excavated from the canal, founded on the rock, and carried up with a batter of one inch to the foot; and at every 60 or 80 or 100 feet, I would insert a cast-iron frame of various sizes, say some of 24 inches square, 20, 18, 12, or any other size, I supposed would be re-

quired, and these being placed at 2 feet or more above the bottom of canal, and masonry extended behind 10 or 20 feet as you please, and a gate fitted to each. I should do the same thing at Juliet, where, if I have not mistaken the information obtained, the State holds control of all the water-power on the river. This will permit you to sell water-power at any point, and in such quantities as may be wanted, and the purchaser has nothing to do but erect his building and introduce his water; and you sell the water by the inch as is customary.

This wall, with the earth behind it, is a great additional security to the bank, and the water is more desirable from this security. I would advise also, as a precautionary security, the leaving a bar of earth at Chicago river, of 30 feet wide; and when the water is let into the canal, I would only take away 25 or 30 feet wide. I would not fill the summit level with the water from the Chicago, but let it fill slowly from other streams, before I broke this bar of earth; this can be removed by a dredger.

2d. Will a slope wall be necessary through the earth excavation of the summit?

If the earth proves to be all of the quality of section No. 1, and others I have seen, I would on no account have a slope wall. Such wall, below the surface of water, is very injurious to boats if they strike it; and if any wall is required, it can only be to protect the bank above water, and that can be made, when the water is in the canal, very cheap.

I believe, with the soil in this cut, vegetation may be made to grow upon it, and then the frost and rains will not disturb it much, and no wall will ever be needed.

3d. Will it be necessary to cut down the towing-path?

I would by no means advise cutting down the towing-path; only add 50 to 100 per cent. to the length of the tow rope, through the earth cutting, and the trackage is easy. By being so high, the horse is in a cooler atmosphere, and is not so likely to be thrown into the canal at the rock excavation. The Board may find it useful to make places in the rock in the form of steps, where a horse may be taken out, if by accident he should be thrown in; and I see no great or even any important benefit by cutting down.

4th. Is the present plan of drainage a judicious one, and what difficulty may be anticipated from water, in excavating the summit?

The greatest difficulty in working this division, is the water, beginning at Chicago river, and from thence to the end of section 15. If I have understood the plan of the chief engineer, it is his intention to have a large ditch outside of the spoil-bank, on the upper or southeast side, and this to be extended, as now partly done, to the south branch of the Chicago.

It may perhaps be found that some of the sections near the Point of Oaks do not drain freely by this ditch; if so, then they must be drained across the canal. A guard-bank of earth must be raised along the north side, to keep out the water from the Des Plaines river and from the prairie. These precautions will keep out surface water, which is nearly all they have to contend with on this part. From the Point of Oaks, on section 15, to section 45, is the most difficult part to drain.

Many of the sections, from 15 to 39, will drain across the canal, and bank out the water of the river and marsh at first, in pieces or parts of their work.

But in order to drain this part, from 15 to 45, effectually, a very large drain, nearly or quite the size of a 40 feet canal, should be cut, from section 42 or 43, and extend eastward through the whole Saganaskee swamp, to Stoney creek. This must be cut 3 feet at the canal, and 8½ feet deep at the summit of the swamp, 5 miles east of canal, and then continue 7 or 8 miles further, before it will find a free discharge; the water having so far to run, must have a large bed, as there will be a great collection of water in heavy rains.

If the Board could feel justified in laying out a canal, and excavating it regularly, 26 feet on the bottom, it would not do more than take off the land water between sections 15 and 45, which must all pass out this way, unless it is passed across the canal, and that will be very difficult at times; and at finishing the work, a large and regular ditch must be cut on the upper side of the canal, from section 15 to the proposed ditch in the Saganaskee swamp. This must be outside of the spoil-bank, a guard-bank placed on the lower side, also a ditch from section 45 to section 42.

I cannot urge too strongly upon the Board the very great importance of having a very large drain through the Sag swamp. It is vitally important to the prosecution of the canal successfully; and its whole cost, if made as I have recommended, will be saved in the ease with which the water will be taken off from the work. From section 45 towards Lockport, a drain is to be made; the upper side is now going on; (this is right.) I have been particular in describing all these drains; they are, however, only recapitulating the plans of your engineers, except as to size, and which I think judicious.

5th. Are the contract prices for the work, as let on the canal, sufficient to finish it?

I think all the contracts I have noticed are let at what I should consider very high prices. It is true that I ought not to compare prices given for work in the Atlantic States with this, because of the great difficulty in obtaining labor and provisions here; as to the latter, it will be growing better yearly, and so will the price of labor be reduced before the completion of this work. If contractors cannot sustain themselves with their contracts, it will be for want of good management.

6th. "The size of the locks proposed for the Illinois and Michigan canal is 18 by 110 feet in the chamber. Do you think this the proper size of locks for this work?"

I do not think I can suggest any improvement in the size of the locks; it is the best possible. It will carry a boat with 150 tons of lading if required. The location of the locks at Lockport I think very judicious and good; and the plan of entering the Des Plaines above Juliet I think right, after making dam No. 1 on State property above the present village of Juliet, and passing down to dam No. 2. I should then, in both cases, make my lift-lock walls so high as to be a guard-lock. I should only have two dams at Juliet. The line is then plain to the Du Page, and passes that river on an acqueduct, and then passing over pretty fair ground till we reach the Kankakee bluffs. In my examination of these bluffs, which have been considered as presenting great difficulties, I think your engineer has proposed locating his line well and skilfully, in keeping so far from the hills as to give it a chance to slip without coming into his canal. I do not believe there will be any difficulties which will not be easily overcome. Around these bluffs your engineer has estimated a much larger quantity of slope wall than I should use in that work; (perhaps I may be wrong.) Passing on, the canal is to cross the Au Sable river, in a pool formed by a dam, requiring a guard-lock on lower side. The line pursues a plain route of good location to Fox river, over which it is to pass by an aqueduct. The plan of the aqueduct, if built of wood upon stone piers, is all right, and the location cannot be improved.

Here it is proposed to take a feeder from Fox river, about four miles in length. After examining the ground on the two lines run on west side, in company with the chief engineer, I should give my opinion that the short line with the deep cutting ought to be adopted.

If hydraulic power can be obtained at Ottawa, through a branch canal to be made for the accomodation of the village, and to lock down into the Illlnois, I would locate it at right angles with the main stem; and as soon as I left the main line, I

would lock down 5 or 6 feet to the level of the plain, and carry that level through at any point between Clinton and Fulton streets, making large basins one or two blocks north of the land now sold and occupied. After bringing the canal to the line of the street, below all property sold by the State, I would carry a mill canal along the south side of the street towards Fox river, and place cotton, woollen, or other factories requiring steady power, below this canal, giving them 15 or 16 feet head and fall; then leaving a space of 200 feet (more or less,) I would have canal No. 2, parallel to the other; and on this, I would sell water-power for works not requiring steady power.

The line then, after passing over good ground for many miles, reaches Camp rock and Pecumsagan, and Little Vermilion, all which it passes very well; and although some little expense will be required in lining and puddling the porous rock and earth, there is no doubt the location is well made.

In relation to the termination by a steamboat canal and basin of large capacity, together with a canal boat basin between the two locks, I think the whole plan is excellent, in relation to the business of the canal and the prosperity of the State, and I do not think I can suggest any improvement.

If I should make any remark in relation to the work and plans upon this canal, it will be to substitute stone aqueducts in place of wood over Fox river, Du Page, Vermilion, and other smaller streams, where wooden trunks have been proposed, more particularly Fox, Vermilion, and Du Page; these being large and important works of art, they ought to be built with stone arches, *if stone of good quality can be obtained.*

I see there is difficulty in finding good durable stone in the country. I saw some good ones about Peru, and perhaps the same strata may be found in the hills at or near Ottawa. I would by no means advise to build of bad stone. A wooden trunk, upon stone piers is better than a structure of stone that will soon decompose.

If good stone for the cut work, and particularly the arches, could be found 50 or 100 miles below, and near the river, they could not be very expensive to transport at a proper state of the river; all the stone for the dead work might be found at hand.

If your Board cannot find good stone for locks, it will be very unfortunate. These structures should be done in the best manner, and laid with the best of water lime. I shall send Mr Gooding a sketch of the latest improvements in locks.

I presume it will be some time before the Board will offer contracts for locks, and in the mean time, stone of good quality may be found, it is to be hoped.

In reviewing the whole line of this proposed canal, the location of it and the plans proposed to overcome all the difficulties, I cannot award too much praise to your engineer. He has shown skill and sound judgment in every part of the line, and I do not think the plans he has laid down for the prosecution of the work can be improved upon or made better with the materials so far discovered.

I have the honor to be,

Gentlemen, your obedient,

BENJ. WRIGHT.

J.

Lockport, Illinois,
November 28, 1837.

To Wm. Gooding, Esq.
Chief Engineer Illinois and Michigan Canal.

Sir: I have the honor of presenting to you the data, map, and estimates of the survey of the Saganaskee swamp—Grassy lake—Stoney creek—and the Calumet river, to the State line, made by my party under your instructions in July last, with reference to the proposed connection of the Illinois and Michigan canal with the Michigan and Erie canal of Indiana.

Agreeably to your directions, the survey was commenced at the mouth of Stoney creek, upon the Calumet river, and continued up that stream to the State line, with a view of locating as high a dam near the point of commencement as the nature of the stream and its banks would permit, in order to create a pool for canal boat navigation from the State line to said dam, as well as to enable us to pass the summit of the Saganaskee swamp, with the waters of the Calumet, upon the line of the proposed Illinois and Indiana canal, with the least possible cutting. This line of river and canal navigation completes the proposed connection within the limits of the State.

When the survey was made, the streams were very much swollen by rains, and I was informed that the Calumet was seldom, if ever, known to be higher than at that time. The distance by the left bank of the Calumet river, from the point at which the dam was afterwards located to the State line, was found to be about twelve miles; which will be lessened by the plan of improvement to eleven and a half miles, by clearing and changing the direction of that bank. The surface of water at the mouth of Stoney creek was found to be 0.820 below. The base line of level was assumed at 11.500 above the bottom of the Illinois and Michigan canal at lake Michigan, or 5.500 above; the lowest surface of the lake at the proposed site for dam, 0.500 below; at the old Indian ford, 2.087 above; at the State line, 5.772 above; and at a point above Gibson's bridge, and about two and one-third miles, in the State of Indiana, 7.867 above. The banks of this river are very uniformly about 8.500 above, so that in Indiana, above where one level line terminated, they were overflown by the ihgh stage of water to a very great extent.

These examinations made, the site of the dam was located about sixty chains above the mouth of Stoney creek, as indicated upon the accompanying maps, and its height placed at 4.000 above, that being considered the highest that could be safely adopted with reference to the foregoing levels, and the low nature of the banks of the Calumet, and much of the surrounding country. The width of the river at this point was found to be 295 feet from bank to bank; and the average depth of a cross section of the stream, to the base of the foundation for the proposed dam, was fixed at seven feet; so that the average height of the dam (which has been assumed at 4.000 feet above the base line,) will be 11.5 feet. The foundation is gravelly and probably based upon a bed of lime rock.

A dam of this height will elevate the surface of the river, at the State line, to about 5.500 above, at the lowest stages of the water, and to about 6.500 above, at the highest; allowing one and a half inches per mlie for back-water during the lowest stage, and two and a half inches in the highest.

The right bank of the river is the most uniform, being indented with but few sloughs, as its drainage runs chiefly into the Big Calumet, which lies directly behind and parallel to it, whilst the left bank is broken by many, requiring embankment and tow-path bridges. It is believed, however, that the expense of tow-path bridges to cross the Calumet above and near the dam, and to recross, as would be advisable in the first case before reaching the State line—and the additional expense of grubbing upon that bank, together with the fact that the tow-path would then be upon the least productive side of the river, are considerations that will justify its location upon the left bank, at the expense included in the accompanying estimate.

In the location of the Illinois and Indiana canal, but one route was adopted, except for a short distance, in crossing from the Calumet to the valley of Stoney creek, for which distance two routes have been estimated. The shortest leaves the river 34.72 chains above the dam—the longest 18 chains above, and they both unite at station 19 of the longest line, at distances of 47.07 chains, and 57 chains, respectively, from the river. A guard-lock has been estimated, for either case, where these lines leave the river. The first line is, including 16.72 chains river navigation, 26.65 chains shorter than the last. From the junction of these two routes near Rexford's bridge, the line follows up the right bank of Stoney creek, passing eastward of Lane's island, and to the left of Grassy lake, (an expansion of Stoney creek) to the Saganaskee swamp, over which it then runs from a point of Lane's island to the mouth of Paddock's brook, the main tributary of Stoney creek; thence continuing about 65 chains, to the Calumet and Des Plaines summit of the Saganaskee swamp, it follows the depression of said swamp, which descends almost uniformly to the line of the Illinois and Michigan canal, with which it connects, by a lockage of 11.25 feet, at the distance of 15 miles and 60 chains from the point of commencement. In construction and at a more favorable season, the line may be straightened, and made somewhat shorter, by throwing it further from the shore into Grassy lake. The dimensions adopted for the canal were twenty-six feet bottom, and forty feet at top water line—four feet deep—slopes of one and three-fourths to one. No declivity has been allowed. These dimensions are those proposed for that portion of the connection which is to be constructed by the State of Indiana.

The bottom of Stoney creek at the outlet of Grassy lake, or first ripple of Stoney creek, is about 0.500 below; the Des Plaines and Calumet summit of the Saganaskee swamp, as the line is located, is 9.500 above; and the point of junction with the Illinois and Michigan canal is about 3.25 above.

A second route was examined, diverging from the first, at station 41, and following a deep slough to the old Sag bridge, westward of Lane's island, thence descending that branch of the Saganaskee swamp which receives its water from Bachelor's grove &c., (tributary to Stoney creek,) it unites with it again at station 296, near the summit of the first line. This route would give us a second summit to pass, that is higher than the first, with rock cutting to a very considerable extent, whilst the distance saved would not much exceed one mile.

The exavation of the line adopted is estimated to contain hardened clay, but no more rock, it is believed, will be met with than is included in the small item of the accompanying estimate. It should be stated, how-

ever, that on account of the great depth of water upon the Saganaskee swamp, at the period of the survey, it was not possible to test the nature of the excavation, from the summit to the turnpike, in a conclusive manner.

All of which is very respectfully submitted by

Your obedient servant,

WARD B. BURNETT.

Estimate of the stone work of abutments, guard-lock, &c., is estimated, upon the ground that the stone may be transported upon the prism of the canal filled with the drainage of the country, from the vicinity of the Illinois and Michigan canal.

	For the dam across the Calumet river	$16,839 82	
2,000	cubic yards, guard-bank, at 20 cents	400 00	
30,000	cubic yards tow-path embankment, at 20 cents - - - - -	6,000 00	
10,000	cubic yards excavation and clearing of bank at, 25 cents - -	2,600 00	
260	feet tow-path bridges of 30 feet span and less, at $2 the foot run -	520 00	
510	feet tow-path bridges over 30 feet span, at $2 75 - - - - -	1,402 50	
840	feet timber for seven 4 feet drains, at 10 cents - - - - -	84 00	
30	chains first class grubbing, at $10 00	300 00	
76	chains second class grubbing at $6 00	456 00	
142	chains third class grubbing, at $3 00	426 00	
	For the proposed improvement of the Calumet river - - -		28,928 32
For 548,311.90	cubic yards, excavation for canal (including hardened clay), at 30 cents	$164,493 57	
For 5,768.80	cubic yards rock excavation, at 90 cents - - - - -	5,191 92	
For 11.25	feet lockage, at $25 per foot lift -	28,125 00	
For	one guard lock, gates, &c. - -	8,691 25	
For	two waste-weirs and tow-path bridges -	1,975 00	
For	three road bridges (one for turnpike) -	1,650 00	
For	construction of Illinois and Indiana canal		231,034 41
	Estimated aggregate expense - -		259,962 73
	Add ten per cent. for contingencies -		25,996 27
	Total - - - - -		285,959 00
For	shortest line if adopted to Stoney creek, from Calumet river, 16,743.26 cubic yards additional, at 25 cents - - -		4,185 81
			$290,144 81

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